Reports of the

UNIVERSITY OF CALIFORNIA ARCHAEOLOGICAL SURVEY

No. 48

PAPERS ON CALIFORNIA ARCHAEOLOGY: 70–73

Issued September 22, 1959

The University of California Archaeological Survey
Department of Anthropology
University of California
Berkeley 4, California

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70. A Report on Indian Sites and Trails Huntington Lake Region, California

Margaret G. Hindes

In a five year period, from 1953 to 1958, one hundred and twelve sites in the Huntington Lake region have been explored and reported. Most of the sites have been visited by the author, but it should be noted that the survey has been a cooperative project between several persons. Brother Avila, F.S.C., presently teaching at the Christian Brothers' School in Sacramento, and Mr. L. A. Robinson of Big Creek, California, have been my chief collaborators and have discovered a great number of the sites mentioned in this report. I should also like to extend my thanks to the following persons who provided information and assistance in the furthering of the project: my husband, Mr. B. G. Hindes, and my brother, Dr. M. R. Gibbons, Jr., both of Ross, and Mr. T. Newton Russell of Fresno, California. In addition I wish to acknowledge my debt to the following persons who served as informants concerning the Indians and the archaeology of the Huntington Lake region: Mr. Harvey Ince of Fresno; Mr. and Mrs. John Marvin and Mrs. Emma Majors of Auberry; Mr. Morgan Blasingame and Mr. Knox Blasingame, Jr., of Clovis; and Mr. Fred Ross of San Jose, California. Finally, my appreciation is here expressed to Dr. R. F. Heizer and Mr. A. B. Elsasser of the University of California Archaeological Survey in Berkeley, both of whom have offered encouragement and advice in the writing of this report.

The majority of the sites, which are located in altitudes over 4,000 feet, are characterized by the presence of obsidian flakes and occasional artifacts scattered about the surface, and often by associated granitic outcrops containing mortar holes. Most of the exploration has been in the higher altitudes because of the special interest in seasonal occupation of the mountains and possible trade routes from east to west or west to east over the crest of the Sierra Nevada. As sites were discovered, evidence grew that there were established Indian routes in former days, and that Indian sites had been used for different purposes according to location and natural characteristics. This report will attempt to describe the evidence, although more exploration and study will be necessary before final conclusions may be drawn.

As will be seen, ethnographic information or statements by modern explorers of the Sierra, such as John Muir, have been heavily relied upon to

establish use by Indians of the various trails and passes in the Sierra Nevada. In a sense, then, the purpose of the present author's investigation has been to confirm, where possible, such use. It is believed that the finding of even small scatterings of obsidian near or athwart high altitude trails represents confirmation. Furthermore, it has been possible to predict, in some cases, where camp sites might occur. For example, the sites along Ordinance Creek had not been known beforehand to the author. While scanning the topographic map and recalling the nature of the terrain at either end of the area, it appeared logical that sites should occur somewhere along the length of the creek. Subsequent investigation proved this to be the case.

The boundaries of our explorations, and those reported by others in this region, are from Paiute, Mono, and Mammoth Passes on the east, Corlew Meadow (near Auberry) on the west, Evolution Valley on the south, and Cow Meadow and Daulton Station on the north (see Map 1).*

Within this extensive area there are undoubtedly many more sites to be found. Those in the lower altitudes west of the Sierra were explored in order to establish the location of the permanent, i.e., winter occupation, sites from which the Indians came when they made their summer trips to the mountains. No sites in lower altitudes east of the Sierra are reported here, but it has been established, by Steward (1933) for example, that Indians of Mono and Inyo Counties went west into the Sierra to trade.

In searching for sites the following factors for the Indians' choice of location were noted:

1. Nearness to a stream or spring. Frequently sites were found at the junction of two streams.

2. Presence of open sandy levels or near-level ground where maximum sunlight was available. The level area was often a high plateau.

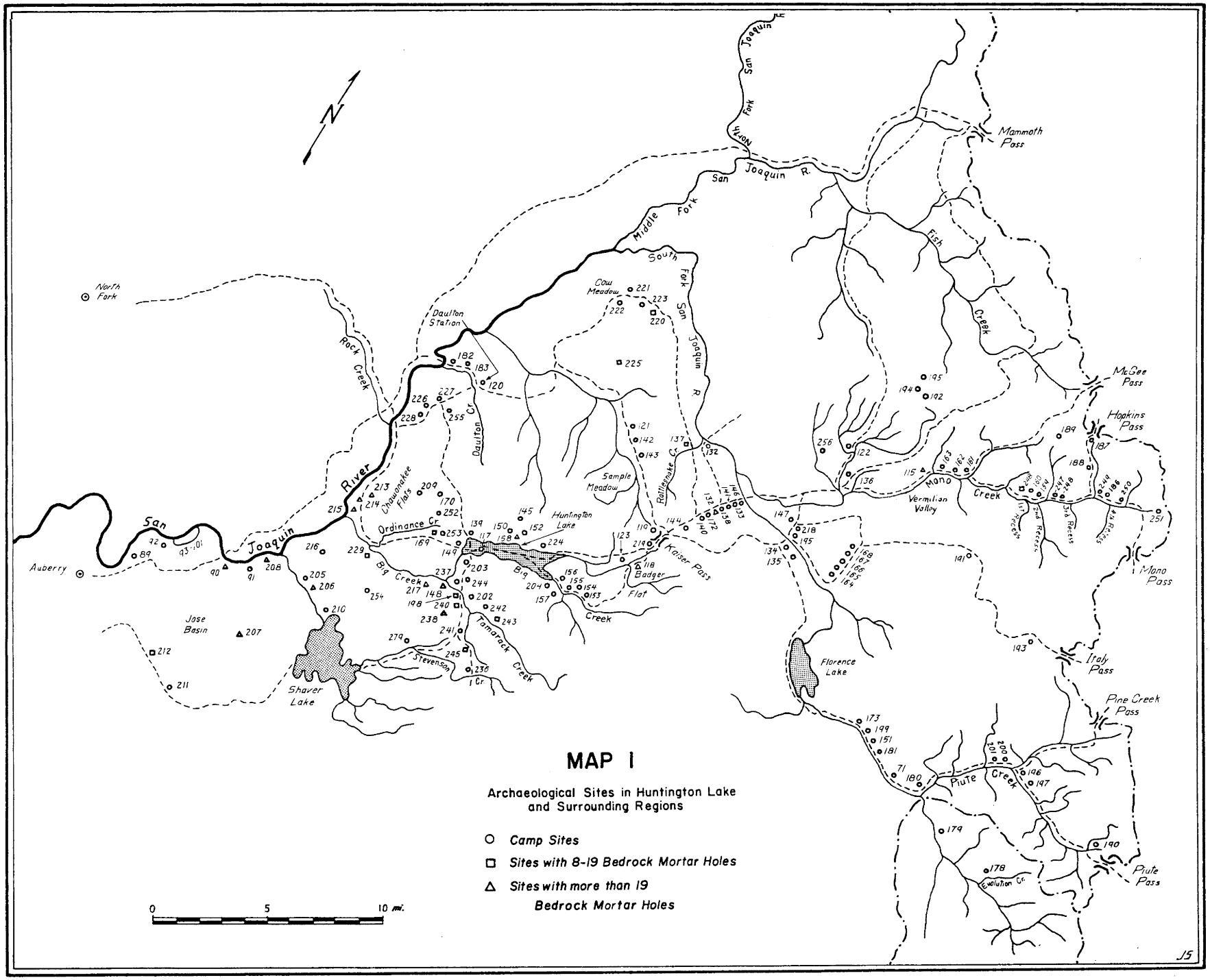
3. Closeness to meadows.

4. Presence of granite outcroppings for bedrock mortars.

5. Relation to main trade routes or route junctions.

Temporary sites, e.g., those used perhaps overnight by small hunting parties or by groups traveling from one place to another, did not necessarily have all these characteristics. However, recognition of these factors assisted us in finding new sites. The evidence presented here was

* Dashed lines shown on map represent, in most cases, trails which were probably in use in aboriginal times.


N
North Fork San Joaquin R.
Middle Fork San Joaquin R.
South Fork San Joaquin R.
San Joaquin River
Mammoth Pass
Fish Creek
McGee Pass
Hopkins Pass
Mono Pass
Italy Pass
Pine Creek Pass
Piute Pass
Mono Creek
Vermilion Valley
Florence Lake
Piute Creek
Evolution Cr.
Rock Creek
Daulton Station
Daulton Cr.
Cow Meadow
Sample Meadow
Rattlesnake Cr.
Ordinance Cr.
Chawanakee Flats
Huntington Lake
Big Creek
Kaiser Pass
Badger Flat
Tamarack Creek
Stevenson Cr.
Shaver Lake
Jose Basin
Auberry
1st Recess
2nd Recess
3rd Recess
4th Recess
MAP I
Archaeological Sites in Huntington Lake and Surrounding Regions
Camp Sites
Sites with 8-19 Bedrock Mortar Holes
Sites with more than 19 Bedrock Mortar Holes
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gained mostly from surface findings, although at five of the sites small test pits were excavated in 1957 and 1958.

The Indians occupying or traveling through this region in historic times were Eastern Mono (Owens Valley Paiute) on the eastern side of the range and Western Mono on the western side. Steward (op. cit., p. 235) reports that "Paiute intermarried and traded with . . . Western Mono, their cultural and linguistic kin." "People crossed from both sides, making hurried trips" (ibid., p. 257). He specifically mentions contact with the Western Mono of the Jose Basin, where there is an historic Indian settlement still occupied by Western Mono.

Mr. Johnny Marvin, a Western Mono now living near Auberry, stated that he thought the Paiute and Western Mono were cousins because of their language similarity, and that all came originally from the Great Basin. Mr. Harvey Ince, a Klamath Indian now living and working at Huntington Lake in the summers, has fairly intimate contact with the Indians of Auberry and says they claim to be part Mono, part Paiute, and part Chukchansi (Yokuts).

Kroeber (1922) groups the Northern Paiute, the Eastern Mono (Paiute), and Western Mono under the Shoshonean (linguistic) family. He states (1923, p. 123) that, "The Shoshoneans were probably spreading out of the Great Basin across the deserts toward the coast. They may have reached the ocean toward the close of the [second] period."

Although, as Kroeber notes (1925, p. 585), the Owens Valley Paiute (Eastern Mono) and the Western Mono have remarkably similar dialects, relationship between the two groups is not so clear-cut where migration legends or physical or culture type are concerned. Gifford, for example (1932, p. 16), writes about a Northfork Mono informant who "said his grandfather told him the first Northfork Mono came from the Bishop region east of the Sierra Nevada. However, I could obtain no story of a migration from across the Sierra, whence the Western Mono may be inferred from their Shoshonean speech to have come. According to their myths, also, the Western Mono of Northfork always lived where they are now." Again (ibid., p. 55), "There is much about the Northfork Mono that suggests close affinity to other tribes on the western slope of the Sierra. Favorable environment permitted more settled existence than that of the Shoshonean relatives of the Great Basin." "All of these Western Mono groups were in their cultural outlook definitely of the San Joaquin Valley drainage rather than of the Great Basin. Their general mode of life was more like that of the foothill Yokuts and the Miwok than that of the Eastern Mono" (ibid., p. 15).

There is, apparently, a contrast in physical type between the Eastern (Owens Valley Paiute) and Western Mono, but not in the direction expected. Gifford (1951, p. 86) states, "Although speaking a language only slightly different from that of the physically distinctive Western Mono, the Eastern Mono are unlike them in physical type and belong instead to the widespread California type to which their other neighbors, the Washo and Miwok, belong." and, "The Western Mono type will probably be found to have relatives elsewhere" (ibid., p. 87).

Whatever the details of the common origin of the Owens Valley Paiute and the Western Mono are, we know that they intermingled for centuries. We also have evidence that the Mono of Northfork and the Mono of Jose Basin were friendly and crossed into one another's territories. Gifford (1932, p. 23) says, "Salt was obtained from a spring named Omabaya, about one mile downstream from Big Creek powerhouse on the south side of the San Joaquin."

Mr. Marvin said that the Northfork Indians used Mono Pass (southern) and we will discuss later the possibility that they mingled with the Mono from the south side of the San Joaquin at sites on the northern border of this region, such as Fre-183 (Daulton Creek) or Fre-137 (Rattlesnake Creek).

There seems to be no possible way to distinguish occupational differences between the sites of the region being studied, and there is, therefore, no way at present to determine whether they were used by Western Mono or Owens Valley Paiute. Mr. Marvin said from what he had heard from his people the Paiute traveled all the way to Auberry, and both Paiute and Western Mono used Mono Hot Springs. Lathrap and Shutler (1955, p. 227) report, "Ethnographic information indicates that the Owens Valley Paiute habitually used specific summer camping spots in the basin of the South Fork of the San Joaquin. These were resting places along their main trail into the San Joaquin River Canyon, which crossed Paiute Pass and followed Paiute Creek down its junction with the South Fork of the San Joaquin. . . . Most of the traveling was done by the Owens Valley Paiute."

Occupational differences might be noted if there were portable mortars at some sites and not at others. Steward (op. cit., p. 239) tells us that the people of Owens Valley and Death Valley used metates and portable (wooden) mortars, respectively, for grinding of most seeds. He does not mention bedrock mortars except in use with acorns on the eastern side of the Sierra (ibid., p. 246). The Western Mono, although employing predominantly the bedrock mortar for grinding acorns, had portable stone mortars and wooden bowls which were, perhaps, related to the Yokuts wooden mortar (Gifford, 1932, pp. 24, 25). We must assume therefore that the Western Mono or Yokuts did not carry their portable stone mortars to the mountains, and

neither the latter nor the people from the eastern side of the Sierra took wooden mortars along to the summer sites. If any group did carry the wooden mortar to the mountains, no trace of it was found in the present survey.

Specific routes have been mentioned in connection with certain Indian groups. Gifford (1932, p. 19) says that the Northfork Mono went to the east by way of Rock Creek and the Middle Fork of the San Joaquin and thence through Mammoth Pass, sometimes remaining a year or two. They went to gather pine nuts (and probably other supplies, such as obsidian). "People from a number of villages traveled together in the trip to Owens Valley, always in summer." Mr. Marvin substantiated this statement.

The Mono Indians on the south side of the San Joaquin from the Shaver Lake area and Auberry area also were reported to have gone into the Sierra to the east. Emma Majors, an old Indian woman (Western Mono) living at Matthew's Mill (near Auberry), told me that each summer her people used to travel into the mountains.

Mr. Harvey Ince told the author that he has heard that the Auberry Indians went to the east by way of Kaiser Pass and thence to the Florence Lake area, also to Mono Hot Springs and Vermilion Valley.

Mr. Marvin commented that "the Indians traveled all over the country." There was probably very little territory they did not cover in their hunting and searching for plants which we know they used, although they probably used specific trails when going from one place to another. He said that when Huntington Lake was a valley without a reservoir, it was used as a rancheria settlement up into historic times by the Indians from the west. This has been substantiated by the finding of sites on every stream entering this former open valley and of heavy deposits of obsidian at the bottom of Huntington Lake when it was drained in 1956.

There are several definite statements in early historical records of California which should be noted in considering Indian routes and trails in this region. They do not mention specific groups but speak of Indians in general. For example, Muir (1913, p. 80) writes, "It is interesting to observe how surely the alp-crossing animals of every kind fall into the same trails. The more rugged and inaccessible the general character of the topography of any particular region, the more surely will the trails of white men, Indians, bear, wild sheep, etc., be found converging in the best places." Muir (ibid., p. 75) discusses the passes used by the Indians as follows: "One of these Indian trails crosses the range by a nameless pass between the headwaters of the South and Middle Forks of the San Joaquin, the other between the North and Middle Forks of the same river, just to the south of the 'Minarets'; this last being about 9000 feet high is lowest of the five. The Kearsarge is the highest." It is now believed that Muir was referring first

to Mono Pass, southern, and second to Mammoth Pass, both within the region here under discussion.

Starr, an experienced Sierran mountain climber, states (1956, p. x): "The trail routes into and across the Sierra Nevada found by early American pioneers were those which had long been used by Indians. . . . These Indian trails evidently afforded means for crossing the mountains for the purpose of trading between tribes living east and west of the range. . . . Owens Valley was the home of Piute Indians. They used [southern] Mono Pass, Piute Pass and Kearsarge Pass to cross the range on the routes of the present trails." Mammoth Pass should be added to this list as it applies to the picture of this region. [Spelling: Piute = Paiute (preferred)]

Solomons (1894, p. 73) gives us the following information: "We were now in more frequently traveled country, being indeed on the old Mammoth trail to Owen Valley. The once celebrated pass--one of the best in the range--may easily be distinguished as the lowest point of the divide."

As already noted, Gifford mentions that the Northfork Indians traveled east by way of Mammoth Pass.

Lathrap and Shutler (op. cit., p. 228) comment: "That there was a trans-Sierra trail running through Vermilion Valley is less definitely established, but the existence of such a trail seems highly probable. . . . Once one crosses Mono Pass going east to west, there is no feasible route except down Mono Creek and through Vermilion Valley."

Solomons (1895, p. 226) mentions Mono Creek, which is the natural route from Vermilion Valley into the Huntington Lake region: "We made our way around to Mono Creek, a large stream which rises on the main crest, flows southwest for about 20 miles, and empties into the South Fork. It was this creek that the old Geological Survey party descended on reentering the mountains from the Owens Valley, and the Indian trail they followed is still used every summer by the few remaining Indians of Madera County." It is probable that Solomons was talking about the Northfork Mono, who, Mr. Marvin said, also used this pass. Solomons might well have added "Fresno County Indians" to those of Madera County.

It has been established without question that there were certain definite trade commodities exchanged between the Western Mono and the Owens Valley Paiute. Sample (1950, p. 5) says, "It seems apparent that in California as a whole, east-west trade was more important than north-south trade." However, she states (ibid., p. 4) that the Mono only occasionally went across the Sierra to the Owens Valley Paiute. This may be true of

their going all the way, but there is certainly much evidence of yearly seasonal travel into the higher altitudes where they went to hunt or trade. In trading it seems likely that there must have been definite trading centers. If one can assume that the articles traded bear some relation to the location of the sites, it may be profitable to consider the sites from this point of view.

Sample (op. cit., p. 18) summarizes the items which the Western Mono received from the Paiute: "Rabbit skin blankets, moccasins, rock salt, red and blue paint, sinew backed bows [juniper?], jerked deer meat, nuts of Digger pine, sugar pine and the piñon, basket water bottles, obsidian, baskets, mountain sheep skins, sleeveless buckskin jackets, leggings of foxskin, unfinished obsidian arrowheads."

The Western Mono supplied to the Paiute: " . . . acorns, willowbark baskets, bead money, manzanita berries, salt, buckskin, clam shell disk and tubular shell money, canes for arrows, acorn flour, tobacco" (ibid.).

From the point of view of this study and the analysis of site locations, obsidian becomes an important trade item because of the area from which it came. The obsidian found on every site in this region probably came from the east side of the Sierra Nevada, which meant trading or gathering on the spot for the Western Mono. Steward (op. cit., p. 262) says, "Mono Lake obsidian came from Glass Mountain [between Bishop and Mono Lake, northeast of Mammoth Pass]. . . . Other sources of obsidian were: volcanic rock (bearing petroglyphs) at Fish Springs and probably lava south of Big Pine and near Bishop. A poisonous obsidian, which people avoided touching, was said to occur at the Bertrand ranch, 60 miles northwest of Benton."

Meighan (1955, p. 9) states, "One of the most interesting locations in the Benton Range is an extensive obsidian quarry. . . . Larger concentrations, including rather extensive veins of obsidian (both red and black) are found as outcrops in various localities, the most important being Glass Mountain." So far as the sites of the Huntington Lake region which may have been connected with this finest obsidian quarry are concerned, its location is significant. However, it should be noted that obsidian of poorer quality was available to the south and east.

Game in the mountains was one of the chief attractions as food, but represented as well an item of trade, in skins, for example. It is reported that the salmon which came up the main San Joaquin was much prized and that Indians, even the Paiute from the east, traveled many miles to obtain it. The question of whether trout occurred in this region is controversial. The absence of any native fishing implements, as far as we are able to recognize

them, is perhaps indicative of the absence of trout. Hutchinson (1903, p. 205) reported, "No fish and but little game can be found in the region. From the time we left Big Creek . . . till we reached the lower course of Fish Creek we found the streams troutless."

To return to the subject of routes, let us consider certain ones which are well known and traditionally accepted as Indian trails in this region. The Mono Trail and the Shaver Trail still appear on the 1953 U. S. Geological Survey map. The Shaver Trail runs from the North Fork of Stevenson Creek, which flows into Shaver Lake, to the South Fork of Tamarack Creek, where it joins the Mono Trail. The latter proceeds up the South Fork of Tamarack Creek to its junction with Pitman Creek and thence to the present location of the Southern California Edison Power Company Dam No. 2 at Huntington Lake. It goes from here to Kaiser Pass east of Huntington Lake, over the slope (not around it, i.e., by the present vehicle road) to the location of Camp 61 (former construction camp of the Southern California Edison Company), across the South Fork of the San Joaquin to Mono Creek and up this creek to Vermilion Valley. From here it proceeds up Mono Creek beyond the Four Recesses to Mono Pass.

On Map 1 may be noted a series of small triangles which represent the larger sites along this route. Largeness is judged according to the number of bedrock mortar holes present and the horizontal measurements of the site. It is apparent that the majority of the larger sites, other than permanent sites in the lower altitudes, are on this Mono Trail. This was further substantiated by Brother Avila's exploration of the Mono Creek route in the summer of 1958. Sites were found strung all along the trail east of Edison Lake to Mono Pass. The historic Vermilion Valley site excavated by Lathrap and Shutler was one of the sites on this route.

The main sites and probable trading centers on this trail are Fre-158 at Line Creek (Huntington Lake), Fre-118 (Badger Flat), Fre-123 (near Camp 61), and Fre-115 (Vermilion Valley).

Bennyhoff, in his Yosemite report (1956), has classed a large village as one having 19 or more bedrock mortar holes. All of the sites shown as triangles on Map 1 fall into this category, and all of these above 4,400 feet, except Fre-217 (Camp Sierra), Fre-148 (Town of Big Creek), and Fre-238 (Snowslide Creek), are found along this main stem. Sites Fre-217, 148, and 238 may be considered as occurring on a lower branch of the Mono Trail used by Indians from Jose Basin.

For purposes of analysis let us assume that the size of the site is indicated by the number of bedrock mortar holes. There are, of course, many

factors that may influence the presence of mortars, such as the purpose for which the site was used and the type or condition of the granite. For example, a site may have had repeated use for short seasonal periods, in which case there may be extensive scatterings of obsidian chips remaining and but few shallow mortar holes. Such sites were probably used temporarily when the Indians were enroute to larger sites or trading centers. Sites that seem to fall into this category are Fre-256 (Boggy Creek #1), Fre-169 (Sheepthief Creek), and Fre-198 (Tamarack-Pitman, West). Table 1 below summarizes sites located in 1957 and 1958 and lists number of bedrock mortars and altitudes.

Table 1

Altitude and Number of Bedrock Mortar Holes Per Site

Site	Name	No. of holes	Deepest hole (in.)	Altitude of site (ft.)
Fre-115	Vermilion Valley	22	3 1/4	7600
Fre-117	Under Huntington Lake	some		6900
Fre-118	Badger Flats	29	6	8328
Fre-119	Summit Meadow, North	5	2	8720
Fre-123	Nr. Camp 61	31	6	6960
Fre-137	Rattlesnake Creek	14	7	6720
Fre-142	Central Sample Meadow	4	2 1/2	7840
Fre-145	Line Creek #4, North	5		7760
Fre-148	Town of Big Creek	31	8	5017
Fre-149	Dowville	6	4 1/2	7040
Fre-158	Line Creek #1	31	8	6960
Fre-161	Mono-North Fork Creeks	2		7779
Fre-169	Sheepthief Creek	15	7 1/2	7440
Fre-186	Mono-Hopkins Creeks	9	5	9280
Fre-198	Pitman-Tamarack, West	11	3	7117
Fre-202	Pitman-Tamarack, East	4	5	7149
Fre-205	Orchard, Stevenson Creek	7	shallow	4400
Fre-206	Stevenson Creek Bridge	21	8 1/2	4400
Fre-207	Matthew's Mill	254	9	3106
Fre-208	Burial Site, Edison Rd.	19	8 1/2	2160
Fre-209	Stream N.of Mushroom Rock	6	4	7120
Fre-210	Shaver Dam	1		5280
Fre-211	Alder Springs Rd.	4	shallow	4509
Fre-212	Corlew Meadow	10	deep	4356
Fre-213	Chawanakee Flats, ABC	52	6	3120

Table 1 (continued)

Site	Name	No. of holes	Deepest hole (in.)	Altitude of site (ft.)
Fre-214	Chawanakee Flats #2	21	7	3200
Fre-215	Chawanakee Flats #3	31	7 1/2	2640
Fre-217	Camp Sierra	20	8 1/2	4400
Fre-220	Hoffman Meadow	18	7	7000
Fre-225	Half Corral	14	4	8200
Fre-226	Stump Springs Rd. #1			4560
Fre-229	Edison Rd. #2	11	7	3360
Fre-236	Tamarack Meadow	5	3 1/2	7360
Fre-237	Pitman Creek #1	2	1	7200
Fre-238	Snowslide Creek	19	9	5600
Fre-239	Camp 73	4	2 1/2	6080
Fre-243	Tamarack Creek #2	15	5	7300
Fre-244	Highway 168, #1	5	6	7280
Fre-245	S. Tamarack Creek #2	18	6 1/2	7561
Fre-246	First Recess	8	4 1/2	8340
Fre-247	Mono-Laurel Creeks	1	3 1/2	8960
Fre-252	Ordinance Creek, West	5	8 1/2	7520
Fre-254	Ely Meadow	1	2	5875
Fre-255	Stump Springs #4	2	shallow	5400
Fre-256	Boggy Creek #1	6	2 1/4	7760

In the light of present explorations and historical reports, it seems now within reason to establish definitely that the Mono Trail was a main route and central stem through this region.

Lathrap and Shutler have mentioned the route through Paiute Pass by way of Blaney Meadows, Hutchinson Meadow, and Humphries Basin. In the summer of 1957 Brother Avila followed this route and found sites as expected, proving the use of this trail to the Pass.

Although it has not been possible to explore the routes all the way to Mammoth Pass, we have Gifford's report (1932, p. 19) that the Northfork Indians used this pass. It is believed that there were several routes from the Huntington Lake region which joined this route.

There are many trails which have suggested themselves through exploration of sites which branch from the main stem (Mono Trail) or join it from other directions. The permanent centers of occupation, i.e., winter villages, on the west of this region were at Auberry (or Jose Basin), possibly at Shaver Lake, at Northfork, and at Chawanakee Flats. There were two routes from the Jose Basin area to the higher altitudes, according to sites discovered. One was by way of Corlew Meadow (Fre-212) and the Alder Springs site (Fre-211) to Shaver Lake. The other was by way of the general route of the Old Railroad Grade Road to Camp Sierra (Fre-217) and Big Creek or over to Chawanakee Flats, one of the largest settlements just below the mountains. From Big Creek the Indians may have gone up by way of Snowslide Creek site (Fre-238) or Camp Sierra (Fre-217) to meet the Mono Trail out of Shaver Lake, or they may have crossed at Power House No. 2 on Big Creek and proceeded up Ordinance Creek to Huntington Lake. Those coming from Chawanakee Flats probably used this latter route. Explorations have indicated the presence of two fairly large sites on the Ordinance Creek route, Fre-169 on Sheepthief Creek, and Fre-229 on Ordinance Creek. Mr. Marvin told us that the old trail which ran up the ridge to the south of Ordinance Creek can still be found. Locating this trail was important since it probably represents the only other feasible route in this precipitous terrain, besides the Mono Trail itself, from the lower altitudes up to Huntington Lake.

There is also evidence that the Indians of Chawanakee Flats went around to Daulton Creek and Kaiser Creek to the north by way of benches above and east of the main San Joaquin River. Sites have been located along these benches. By this route they could proceed to Mammoth Pass as did the Northfork Indians or follow up Kaiser Creek to Sample Meadows and thence to Kaiser Pass and on to Mono Pass.

It is interesting to note the sites along the meadows on the south and west sides of the South Fork of the San Joaquin River. With the exception of Fre-221 (Cow Meadow), these fall in the small village category (8 to 19 bedrock mortar holes). Fre-220 (Hoffman Meadow), Fre-225 (Half Corral Meadow), and Fre-137 (Rattlesnake Creek), for example, are all small village sites represented by small square symbols on Map 1. Rattlesnake Creek is within easy distance of the large Mono Trail site Fre-123 (near locality known as Camp 61). These sites not on the Mono Trail may have been used in connection with trade or routes to the north. As has been pointed out above, the finest obsidian was to be found to the north. Fre-123, an outstanding site both in size and location, could have been a trading center for Indians from the north as well as from the east and west.

A preliminary comparison of projectile points from the northernmost sites explored in this region by 1957 was made with specimens from Yosemite,

and Mono County. Although the study was done on the basis of surface findings only, it indicated that the points from these sites were more similar to those of northern sites in type and number than to those from sites to the south, i.e., Iny-2 and Fre-115 (Vermilion Valley). Lathrap and Shutler, (op. cit., p. 233) report that "the point assemblage from Vermilion Valley as a whole is remarkably similar to the collection from Iny-2, an historic Owens Valley Paiute settlement on the eastern side of the Sierra 60 miles [to the] south."

It was also discovered by my study of the points from the general Huntington Lake region in 1957 that they were not similar to the Vermilion findings. This may indicate that there was trading from other sources or occupation by different groups. A thorough study of the artifacts of the region should be made. It may bring to light some interesting facts, although it is likely that the trading and mixing of the peoples will confuse the findings, particularly if the Western Mono and Owens Valley Paiute had similar cultural development and constantly intermingled and shared the sites.

More exploration is necessary before we can be sure that the Indians from the Huntington Lake region traded with the Indians who used the Mammoth Pass or traveled there themselves. However, it is obvious that there were more trails out of the region to the north than to the south. Seven possible routes from the Huntington Lake region to the north are known.

Besides those already mentioned, other possible routes were: out of Vermilion Valley by way of Cold Creek and Goodale Pass, by Boggy Creek site (Fre-225) to Margaret Lakes, and by the North Fork of Mono Creek and the general route of the present Muir Trail. Sites have been located to indicate the possibility of all these routes. Another route as yet unexplored was probably from Mono Meadow to Four Forks Creek to Rock Creek, thence to join the trail to Mammoth Pass. Mr. Knox Blasingame, Jr., who runs cattle in this area, has reported sites at these two creeks. A seventh route is from Huntington Lake, up Home Camp Creek to Aspen Meadow and down to Daulton Station. Sites were found along this route.

It should be noted that it is not possible to travel down in the canyon of the main San Joaquin in this region or down the South Fork of the San Joaquin below Rattlesnake Creek because of the steepness of the former and the boxed-canyon formation of the latter. Sites and trails were above the rivers except in spots where the Indians managed to cross.

Although the areas of Dinkey Creek and Helms Creek have not been explored, there have been few reports of Indian occupation from these sections to the south. However, there probably were Indian routes to the Kings River area.

So far, the major sites and probable routes have been pointed out. There are, however, other sites of interest to be mentioned. In the 1 to 7 bedrock mortar group, temporary sites such as hunting and family sites are to be found. Small sites in the very high altitudes, such as those reported at Hopkins and McGee Lakes near the crest of the Sierra, would seem to defy explanation. However, it is possible that these were used by the Indians when hunting bighorn sheep, which were known to have existed in this area. I have already mentioned that mountain sheepskins were traded from the Paiute. Hutchinson (op. cit., p. 202) reports seeing mountain sheep at Red and White Peak in 1903. Mr. Marvin told the author he had heard that the Indians hunted them. It should also be noted that in 1958 a concentration of obsidian chips was found at McGee Pass. Other high passes, besides the main ones already mentioned, have been reported as showing signs of the presence of Indians. McGee Pass was the only one explored in the present survey (by Peter Hindes), but it appears that all the passes may have been used by the Indians for occasional hunting trips or as the easiest for main travel.

On Map 1 will be noted some small sites on Bear Creek, Big Creek, Line Creek, Tamarack Creeks, and Home Creek. These were probably either small hunting or family sites. It may have been the habit of the Indians to make a small camp and travel to the larger sites for trade and ceremony; more than one large site is seldom found on a stream. There may be scatterings of obsidian along a stream bank in several spots but no evidence of more than one large occupation. It is possible the Indians discovered that disease could spread when persons were camped close to one another on a stream. This would explain why sites were found on so many creeks in this region--a family may have claimed a stream and returned each year to occupy it.

In conclusion, following the results of our explorations and information gathered on this region, it appears that Mammoth Pass, Mono Pass (southern), and Paiute Pass were the three main passes used by the Indians of this area. It is known that the Kings River and Sequoia areas and the Yosemite area had numerous trade routes and may also have had main routes from west to east. The apparent funneling through Huntington Lake canyon from a fan-like spreading of trails is, perhaps, unusual. One can picture a rough triangle formation--the three passes to the east are the long side of the triangle, Huntington Lake is the point of the triangle.

Modern trails marked on the present-day U. S. Geological Survey maps coincide to a great extent with old routes said to have been used by the Indians. The exact positions of the ancient trails are difficult to determine except by location of sites or knowledge passed down by old-timers. We know there are routes not yet explored and many will remain a mystery as they are now overgrown and forgotton by those who, in the past, had occasion to use them.

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71. Further Notes on Clay Human Figurines in the Western United States*

James T. Davis

Since the discovery in 1940 of two fired clay figurines from California representing the female torso, and subsequent similar finds in the western United States, numerous notes on the occurrence of these objects have been published (Heizer and Beardsley, 1943; Heizer and Pendergast, 1954; Morss, 1954; True, 1957; Byers and Morss, 1957; Pendergast, 1957; Wallace, 1957; Bryan, 1959). Two earlier accounts of similar specimens are also available. One of these describes a specimen from Tiburon Island, Gulf of California (Saville, 1924), which is closely similar to several Basketmaker III examples illustrated by Morss (op. cit., Fig. 19) in his report on clay figurines of the American Southwest. The other describes a fired clay figurine found near Nampa, Idaho (Wright, 1890, 1891).

The present paper is offered as a further contribution to the knowledge of the distribution, historical relationships, and possible origin of this rather specialized trait in the western United States, and is based on six previously undescribed archaeological occurrences, five from Marin County and one from Sacramento County, California. A description of these specimens follows:

Unnumbered Specimen from Mrn-124[1]

Provenience. This site is situated at the northern base of a range of hills on the southern edge of a marshy tideland slough where Gallinas Creek debouches into San Francisco Bay. The figurine was collected by George Poore from the surface of the site and is now retained in his personal collection.

General description. This specimen is a dark buff color and is fashioned from a very fine-grained yellow clay. Temper is apparently absent, and it appears to have been fired under an even temperature since no black smudges from carbon reduction are exhibited. A conical breast rises 8 mm. on the left side; another conical protuberance once present on the right side is worn down, as if through a very soft rubbing action, since no abrasive

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*Paper read at the annual meeting, Society for American Archaeology, Salt Lake City, Utah, April, 1959.

1. See End Notes.

striations are observable. Neither of these protuberances is appliqued, hence they may be assumed to have been modeled from the torso. The back of the object is flat and undecorated, while the upper surface thickens evenly toward the middle, being plano-convex in cross section. The head of the figure is represented by a small pinched extension of the body. Running transversely through the head is a perforation 1.5 mm. in diameter. The perforation was probably achieved by forcing a small twig or other object through the head prior to firing--this was apparently burned out during the firing process.

Decoration. Two lines of punctate dots 1 mm. in diameter are present on the neck of the specimen. The upper row consists of four dots, and the lower row contains six dots. Possibly these decorative elements represent a necklace of beads. Extending diagonally from each shoulder and continuing the length of the upper surface are rows of grooves which cross between the breasts. The rows originating at the right shoulder are made up of four irregularly spaced grooves 1 to 2 mm. in depth. That commencing at the left shoulder contains three irregularly spaced grooves having the same measurements. Below the point where the rows of grooves cross is a circular punctation 1 mm. in diameter which possibly represents an umbilicus.

Measurements. Maximum width, 49 mm.; maximum thickness, 23 mm.; length, 56 mm. (See Fig. 1a, b for illustration.)

UCMA No. 1-166230[2]

Provenience. This mid-section of a female figurine was excavated by A. E. Treganza, of San Francisco State College, while engaged in a research project for a private corporation (Treganza, 1955). The site, Mrn-80, is located on the north side of Point San Quentin at the edge of a marshy tideland slough, near the point where San Rafael Creek flows into San Francisco Bay. Recovered from a depth of 30 inches, this specimen has been assigned a Middle Horizon cultural context (Treganza, ibid., p. 16 f.).[3]

General description. The object is a medium buff color on the decorated surface, and the flat undecorated back is a charred dark gray. In cross-section it is plano-convex. Burned-out impressions of grass(?) demonstrate that a binding agent has been modeled with the clay prior to firing. Two small conical breasts rise 3 mm. one-third of the distance from either edge toward the center. Neither of these protuberances is appliqued.

Decoration. Immediately below the breasts, running horizontally across the width of the figurine, are three grooves 1 mm. wide and 1 mm. deep which

are spaced about 2 mm. apart. Situated slightly off-center toward the right breast on the central groove is an ovoid punctation which represents a navel. No other decorative features are observable on this specimen.

Measurements. Maximum width, 38 mm.; thickness below the breasts, 10 mm.; thickness at the breasts, 12.5 mm. (See Fig. 1f for illustration.)

UCMA No. 1-166258

Provenience. Same as that described above for No. 1-166230, except that the present specimen was recovered from a depth of 36 inches.

General description. This fragment is apparently the lower section of a figurine lacking representation of characteristics necessary for identification of sex. It is a golden buff color and was apparently fired under even temperature conditions since no firing discolorations are present. From a rounded base, the sides extend upward almost parallel, diverging slightly outward near the break. The specimen is oval in cross-section at the point of fracture and flattens slightly toward the base.

Decoration. Located midway from either edge 23 mm. up from the rounded base is a small circular punctation 1 mm. in diameter, and, as with the two previously described specimens, it is suggested that an umbilicus is represented. Originating at the navel and extending upward to the break is a series of zigzag lines which appear to have been pressed into the wet clay with a small fragment of clamshell because slight corrugations are present on only one side of each line forming the design elements and are very evenly spaced. The design elements are rather obscured due to erosion of the surface of the specimen, but the zigzag is discernible, and the diamond also appears to be present. Traces of a pink stain are present on the back and appear to be the remains of a red ochre paint with which the figurine was once painted.

Measurements. Width, 18 mm.; thickness, 11.5 mm.; length from base to point of fracture, 44 mm. (See Fig. 1c for illustration.)

UCMA No. 1-77872

Provenience. This object was recovered from a depth of 18-24 inches in the Estero Mound, Mrn-232, by C. W. Meighan while he was engaged in research for the U. C. Archaeological Survey. The figurine is mentioned in his doctoral dissertation (Meighan, n.d., p. 7) but has not been previously described

in print. This figurine may be assigned to a Middle Horizon cultural context as a part of the McClure Facies.

Estero Mound is located on the eastern shore of Estero Limantour, which is opposite Drakes Head inside Drakes Bay on the coast of Marin County, California.

General description. This fragment is the lower half of a figurine lacking characteristics necessary for identification of sex. It is extremely hard and is a dark gray color on the surface while the interior is quite black. Finely crushed shell fragments were apparently employed as a temper. Ovoid in cross-section, it has been carefully smoothed on the undecorated back. From the break, the object tapers gradually to a rounded and somewhat flattened lower extremity.

Decoration. Five lines of punctate dots run vertically down the front of the figurine. One of the rows runs straight down the center while approximately parallel rows run down each side and converge with the center one near the lower termination. The dots are 1 mm. in diameter and vary in depth. Apparently they were made by poking a tiny hollow bone tube or other instrument into the soft clay; the edge of the more shallow punctations is deeper than the center of the holes.

Measurements. Length (fragment), 44 mm.; width at break, 22 mm.; thickness at break, 14 mm. (See Fig. 1e for illustration of this specimen.)

UCMA No. 1-78156

Provenience. Same as that described for preceding specimen, No. 1-77872, except that depth of recovery was from the 12 to 18 inch level.

General description. A crudely fashioned complete female figurine of fired clay. Temper is composed of sparse, finely crushed clamshell and mica crystals, the shell being intentionally included while the mica is probably a natural component of the clay. The surface color is a dull buff. What may be considered breasts are slight prominences which had apparently been pinched from the mass forming the body of the figurine, one high on the left side near the front of the object, the other lower on the right front near the edge. At the flat, smoothed, angular upper extremity, the specimen is sub-circular in cross-section. From this point the front and back taper evenly to a flattened base. As with the other specimens, the back is flat and undecorated.

Decoration. The front and sides of the upper half of the object appear

to have been painted with red ochre. In addition, a crudely executed punctate decoration is present on the body of the specimen. Extending upwards 20 mm. from the base in a crescent is a row of shallow punctations which average 1 mm. in diameter. Curving downward on each side from each breast is a row of similar punctations which are less distinct than those of the lower row.

Measurements. Length, 57 mm.; thickness at upper end, 15 mm.; width at upper end, 16 mm. (See Fig. 1d for illustration.)

UCMA No. 1-85743

Provenience. Recovered from the 24-36 inch level in the Johnson Mound, Sac-6, in association with the clam disc bead complex, this specimen is affiliated with Phase II of the Late Horizon in Central California which is dated at 1600-1850 A.D. (Heizer, 1958, p. 6). The site is located on the right bank of the Cosumnes River on the south shore of a former lake about fifteen miles due south from the city of Sacramento.

General description. This modeled fragment of the upper half of a fired clay female figurine is buff colored on the posterior surface and a dark gray on the anterior face. It was apparently fired by placing it face down in a bed of coals. Temper, in the form of mica crystals, is probably accidental, but small irregular holes seem to indicate that a grass temper had been purposefully employed. In cross-section the specimen is a flattened oval. Two nodal swellings have been pinched near either side of the anterior surface and probably represent breasts. No attempt has been made to indicate a head; the top is merely rounded and roughly smoothed. No decorative element is in evidence on either surface of the fragment.

Measurements. Length from top to point of fracture, 40 mm.; width at fracture, 36 mm.; thickness at break, 20 mm. (See Fig. 1g for illustration.)

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Suggested uses of the human figurines have ranged from toy dolls to fertility symbols employed as charms. Ethnographic accounts of the Pomo Indians of northern California contain descriptions of each of these uses (as toys: Loeb, 1926, p. 222; Barrett, 1952, pp. 350-51; as fertility symbols: Loeb, op. cit., pp. 246-47.)[4] Otherwise similar, but unfired, clay dolls were apparently manufactured by the Californian Coast Miwok (unpublished ethnographic notes of Isabel T. Kelley, cited in Heizer and

Scale = $\frac{1}{1}$

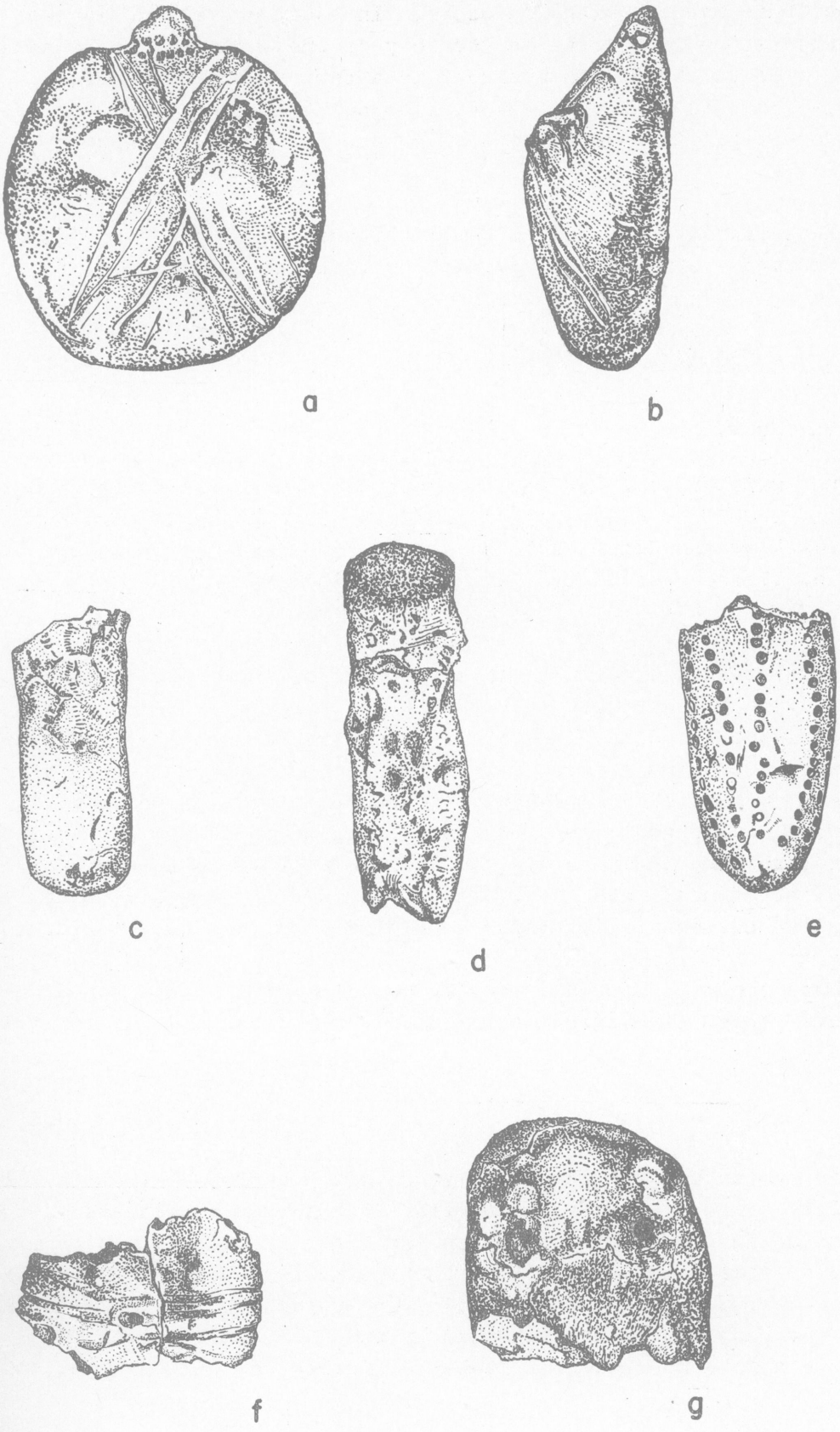
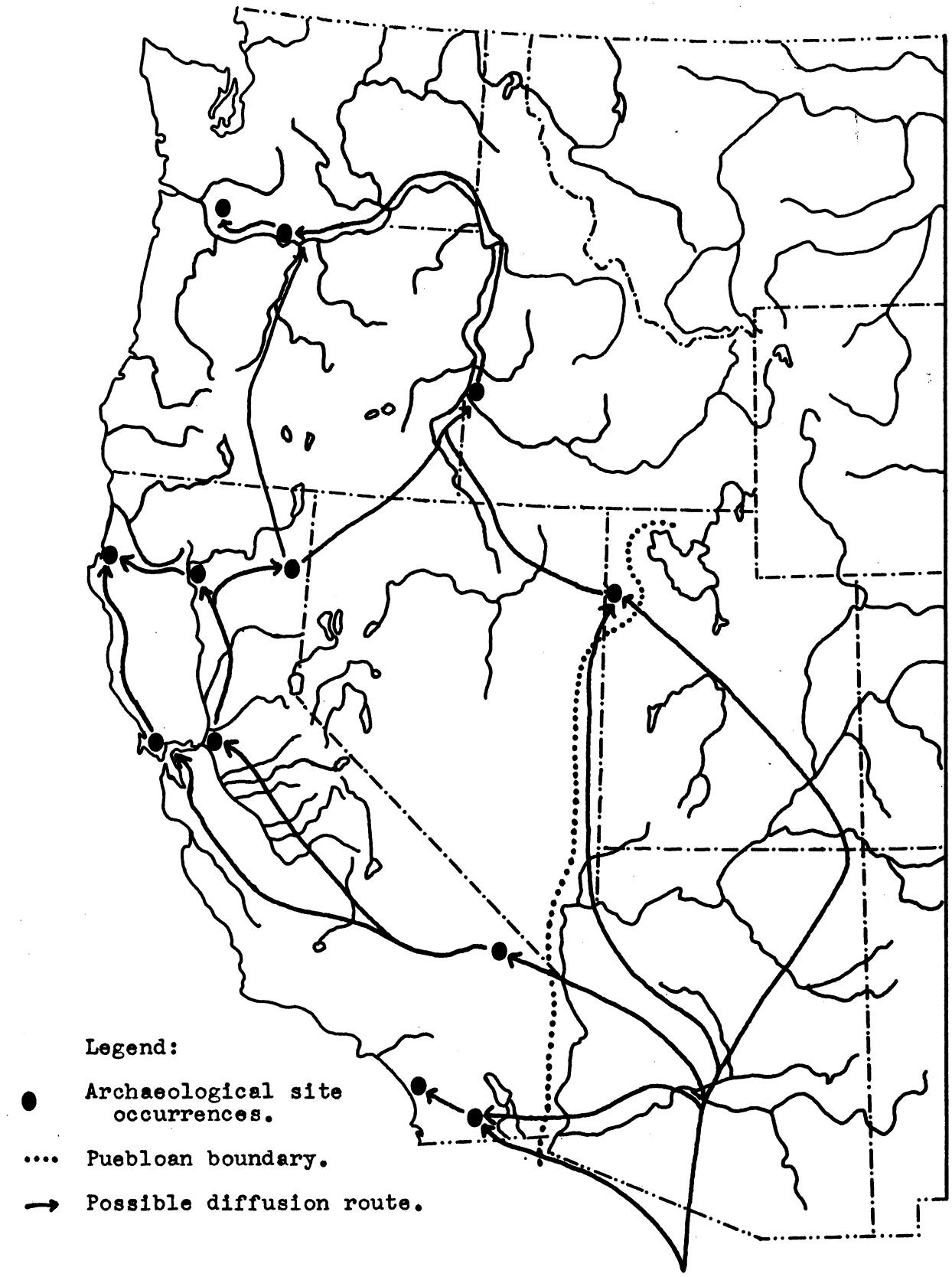


Figure I. Various Human Figurines of Clay from Californian Archaeological Sites



Map I. Archaeological Distribution of Human Figurines of Clay Beyond the Puebloan Southwest

Beardsley, op. cit., p. 204, fn. 7) and the Nisenan (Dr. S. A. Barrett, personal communication).

Gifford and Kroeber (1937, p. 183, Supplementary Note 489) note another type of figurine in use among the Pomo. Referring to a description of a dance house, their informant reported:

"Large numbers of small cradles hung inside, each with baby figurine of magnesite. These placed in [dance] house for luck; . . . all made by old men."

In view of diverse uses of several varieties of figurines in the ethnographic record and apparent temporal differences archaeologically, it might seem futile to speculate on the historical relationship of these specialized artifacts in the archaeological record. However, it is felt that some general considerations and tentative conclusions should be presented now for testing by future discoveries.

In the first paper describing central California figurines, Heizer and Beardsley (op. cit., p. 205) suggest two possible explanations for their isolated occurrence:

" . . . (1) they have an independent local origin . . . ; (2) these figurines are due to an as yet undefined direct diffusion from the south or east."

It is also suggested in this paper that one need not assume a direct historical connection between the northern and central California occurrences (ibid, fn. 21).

In a later study of Southwestern figurines and their extra-regional relationships by Morss (1954), it was suggested that the specimens from California and the Southwest, especially the Basketmaker III examples and to a lesser degree those from the northern periphery generally, are more closely related "than can be explained by 'psychic unity' alone." Heizer and Pendergast (op. cit.) agree generally with Morss' conclusions, basing their decision on further data from California. Specifically they state:

"Reason and probability all favor the conclusion that historical connection of this art exists between these 2 areas [i.e., between the Southwest and central coastal California], but since objective archaeological evidence of similar figurines in the intervening area (south central and Southern California) is not at hand we must admit the problem is still unsolved" (ibid., p. 184).

In the same paper Heizer and Pendergast felt that the northern California occurrences, i.e., those from Humboldt Bay and Shasta County, were beyond the reach of diffusion from the Southwest.

Since then further data have accumulated which tend to narrow the distribution gap in one area at least, that is, in southern California. D. L. True, who described the southern California examples, felt that there could be little doubt that the knowledge of making these figurines was the result of diffusion from the Southwest, specifically from Morss' northern tradition area, although he also suggests the possibility of a later diffusion from the Hohokam, Mogollon, and Yuman areas, perhaps coupled with a post-contact Mexican influence (True, op. cit., p. 295).

Wallace (op. cit., 132 ff.), in a report of an unfired clay female figurine recovered from a rockshelter near Death Valley, California, mentions others having been found in the southern California desert, but these are not described. He concludes that the trait had diffused from the Southwest, probably through the Great Basin.

Two presumed figurine fragments from southwestern Washington are described by Pendergast (op. cit.) in one of the most recent notes on this subject. I am not sure that the two specimens actually represent anthropomorphic figures; however, Osborne (1957, p. 30) states that figurines, presumably anthropomorphic, are known from the lower Columbia River region, and Bryan (op. cit.) describes and illustrates two specimens which appear to be true human figures of clay which were possibly recovered from the same site as the clay fragments described by Pendergast.

Pendergast, in the same article describing the fired clay specimens from Washington, argues for an independent origin for this trait in the Northwest Coast region. He also states that the trait developed independently in northern California and suggests still another independent origin for the central California manifestation. Part of his reasoning is based on the stated assumption that "evidence of cultural interchange between southern and northern California is lacking" (Pendergast, op. cit., p. 179).

An assumption which is inherent in Pendergast's statement is that there must be a direct and primary diffusion from southern to central and northern California. It is felt by the present author that such an assumption is not the only logical one which may be made. Diffusion of a single specialized trait, such as the one under consideration here, may mean the trait's passing from group to group without transmitting any other physical elements with it. Information concerning the manufacture of the object, and ideas about its use may be passed along with it, but unfortunately such information is seldom, if

ever, preserved archaeologically. Certainly, however, the type of inter-tribal contacts necessary for such transmission existed in prehistoric California.

A survey of the literature in the area of trade relations in the western United States demonstrates the existence of considerable exchange and interchange of culture traits, not only within the boundaries of California (Sample, 1950, passim) but between California and the Southwest (Kroeber, 1928, pp. 382-85; Heizer, 1941, 1946; Gifford, 1947, 1949), between California and the Great Basin (Loud and Harrington, 1929, p. 105; Heizer and Krieger, 1956, p. 86; Baumhoff and Heizer, 1958; Bennyhoff and Heizer, 1958, passim), and between California and the southern extension of the Northwest Coast (Gifford, op. cit., p. 7; Drucker, 1955, p. 80). Because of the abundant evidence of diffusion of elements between California and the neighboring culture areas, it is felt that one need not assume several independent origins of the clay human figurine trait in the western United States.

If we are to postulate reasonable hypotheses concerning the origin or the possibility of independent invention of this trait, we must seek correlations between typology, areal distribution, and chronology. However, this is a difficult task because the known distributions are discontinuous and temporal associations are only approximate or entirely lacking beyond the Southwest and the Puebloan fringes of the Great Basin.

A site by site survey of the archaeological occurrence of anthropomorphic clay figurines reveals an enigmatic time-space relationship beyond the Southwest.

In the Southwest itself, including the Puebloan fringes of the Great Basin, that is, the Fremont, Fremont-Sevier, and Colorado River Yuman areas, we have a reasonably clear picture of the areal-temporal relationships and development of this trait. Its first manifestation is apparently during the Vahki Phase of the Hohokam, dated at 300 B.C. to 100 A.D. (Gladwin, 1937, p. 8; Wheat, 1955, pp. 168-188, p. 185, Fig. 12). Slightly later it occurs in the Pine Lawn Phase of the Mimbres Branch of the Mogollon dated at 250 B.C. to 100 A.D. (Wheat, op. cit., p. 185, Fig. 12) and still later in the Anasazi region during the Basketmaker II period (Morss, op. cit., p. 9 ff.) dated at 46 A.D. to 250 A.D. (Morris and Burgh, 1954, p. 48). Subsequently there is a continuous development of the trait in each of the major Southwestern cultures (Morss, op. cit., passim).

Beyond the Southwest we find the trait scattered in time and space. Briefly enumerated, the occurrences are as follows: in the Imperial Valley (Heizer and Beardsley, op. cit.), the Panamint Mountains (Wallace, op. cit.),

and in Shasta County, California (Heizer and Beardsley, op. cit.), we have single occurrences of the trait on record whose time setting is entirely unknown. In northern San Diego County, figurines are known from the San Luis Rey II period during the 18th and 19th centuries A.D. (Meighan, 1954, p. 223; True, op. cit.). In southwestern Riverside County figurines were recovered from the historic village of Temeku (McCown, 1955, p. 39). In central coastal California they occur in numerous sites in Marin (Heizer and Beardsley, op. cit.; Heizer and Pendergast, op. cit.), Sonoma (Heizer and Pendergast, op. cit.), and Contra Costa Counties (Beardsley, op. cit., p. 91), i.e., north and east of San Francisco Bay, sometime between 1500 B.C. and 1000 A.D. (for dating see Heizer, 1958, samples C-690, L-187A, B, M-121 through M-127, and discussion of sample M-648, p. 6). In interior central California the trait is known from Phase II of the Late Horizon, dated at 1600-1850 A.D. (ibid., sample M-648, p. 6). On the northern California coast numerous figurines have been recovered from a large village site on Gunther Island in Humboldt Bay. The age of this occurrence has not been definitely established, but a maximal date of 1000 A.D. has been suggested (Mills, 1950, p. 24).

Twelve fragments of crudely made, undecorated, headless, cigar-shaped, female and asexual figurines of fired and unfired clay were recovered from the Karlo site in northeastern California, actually in the Great Basin, by Riddell (1956). He equates the temporal affiliation of certain burials and artifact assemblages in this site with that of the Early and Transitional Lovelock periods, which date by means of radiocarbon analysis from 1500-958 B.C. to 48-488 A.D. (Grosscup, 1958, Table 1). Two discontinuous culture periods are apparently represented at Karlo, although physical stratigraphy is lacking. The midden is quite shallow: nowhere has more than three feet of culture bearing deposit accumulated and generally the deposit is considerably less than three feet in depth. Also, the site has been considerably disturbed by rodent burrowing, and none of the figurines was associated with a burial. Under these conditions it would prove quite difficult to assign the figurines to any specific culture period within the site. Since the publication of Riddell's preliminary report on this site, he has informed the writer that a radiocarbon date of 2350 B.P. has been secured for this site, which would place it within the Transitional Lovelock period. The most recent occupational horizon in the site, it is believed, is not earlier than 1500 A.D.

In the northeastern section of the Great Basin, the figurine trait occurs at Danger Cave (Jennings, 1957, p. 208, Fig. 188e), again in a deposit covering a great time span, from 5400 B.C. to 260 A.D. (ibid., p. 93, Table 11). Actually parts of the uppermost level, from which the figurines were recovered, are much more recent in time, as evidenced by the presence of

pottery on the surface of the deposit. The one complete example from this site is generally similar in style to certain California specimens, especially to one from Shasta County, California (Heizer and Beardsley, op. cit., Pl. 26b, b', facing p. 200).

Early accounts by G. F. Wright (1890, 1891) describe a fired clay human figurine found near Nampa, Idaho. The authenticity of the antiquity of this find is questioned by Powell (1893). The Nampa specimen differs considerably from other archaeological specimens in that it is sculptured or carved rather than hand-modeled, and the representation of arms and legs is quite different from other archaeological types which have been reported. In spite of the doubt concerning the originally proposed antiquity of the specimen, there is little question but that it was in fact recovered from the vicinity of Nampa, Idaho.

Possible occurrences of the trait in California which are open to question and therefore will not be considered further in this report are: 1) a fragment of clay suggested to be the breast of a female figurine which was recovered from a rockshelter in Siskiyou County in northern California (Wallace and Taylor, 1952, p. 28); 2) a possible perforated female figurine from the Cauley site in Marin County (Beardsley, 1954, p. 52).

The occurrences described above include, to my knowledge, all published accounts of the distribution of the clay anthropomorphic figurine trait in the western United States, beyond the Puebloan Southwest.

If we accept maximal dates in each instance, we are faced with the rather implausible assumption that the trait either originated in the Great Basin and diffused in some manner to California without leaving a trace in the intervening area, or that it enjoyed three or four independent origins and persisted locally for thousands of years with practically no observable effect on neighboring groups.

If we accept other dates within the known ranges in each instance, a clearer and more logical picture develops. We are reasonably sure that the trait was highly developed in central Mexico by about 1350 B.C. (Piña-Chan, B. B., 1956; Piña Chan, R., 1958), and its presence in Mogollon I, the Vahki Phase of the Pioneer Period of the Hohokam, and in Basketmaker II sites indicates that the trait had reached the Southwest by about 300 to 200 B.C. and spread to the San Juan Country by the first century A.D. It is possible that impetus from the diffusion to Basketmaker II could have allowed the trait to reach the northeastern part of the Great Basin sometime later. It is also possible that the trait could have spread northwesterly at about this same time, entering California and diffusing northward along either side

of the Central Valley. From either the northeastern or northwestern section of the Great Basin, the trait could have diffused northward, for example, along the Owyhee River to the Snake River, where it occurs in the ethnographic record (Powell, 1893), and thence down the Columbia. Another possible diffusion route to the Columbia may have been from northern California northward along the Klamath River (Spier, 1930, p. 86, reports the use of clay human figurines among the Klamath) and thence down the Deschutes into the valley of the lower Columbia (see Map 1).

Subsequent diffusions within northern California apparently took place, and the trait has persisted into the ethnographic period among such groups as the Pomo, Coast Miwok, Nisenan, and the Klamath Indians of Oregon (ibid.).

A much later direct diffusion from the Southwest evidently occurred during the protohistoric period, and the trait arrived in southern California in a more elaborate form than is noted for central and northern California.

Documentation of the fact of diffusion of elements, traits, and even entire complexes from the Southwest to California is readily available. It is perhaps true that much of this influence is of a comparatively recent order, but Kroeber (op. cit.), Heizer (1941, 1946), and others suggest that there has been a long continuum, grounded in considerable antiquity, of diffusion of Southwestern influence into California.

Another question arises in a study of this nature, and that is whether or not we are comparing related phenomena. In this instance it is believed that the answer is affirmative. Although there are specific differences between individual specimens from California, the lower Columbia River region, the Great Basin, and the Southwest, there are also specific similarities. Whether or not the specimens are fired, I believe, is really not of great importance, for the specimens from Karlo are both fired and unfired, as they are in the Columbia River region and at Snaketown. Specific differences between the different areas are in representation of facial features and limbs, which become more highly developed in more recent times. Specific similarities are the presence of representation of the umbilicus, punctate and incised body decoration, and representation of the torso only; the back is generally flattened and undecorated. Certain areal specializations are apparent in some instances, for example, the carving of features on the figurines from Idaho and Washington.

If these figurines are directly comparable and historically related, as has been suggested, then it is felt that we are dealing with a specific diffusion of a unit trait, even though time control is lacking. Numerous

examples of specific and selective diffusion of unit traits from the Southwest and/or Mexico to California are discussed in a paper by R. F. Heizer (1946).

End Notes

1. Site number designation assigned by U. C. Archaeological Survey

2. UCMA numbers refer to catalog numbers of U. C. Museum of Anthropology.

3. For descriptions of archaeological horizons in central California, see Lillard, Heizer and Fenenga, 1939; Beardsley, 1954.

4. Barrett does not mention their use as fertility charms. On p. 387 of his monograph, as well as in personal communication, he reports that no informant had ever suggested such a function to him.

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Explanation of Illustrations
[Following page 20]

Figure 1:

a,b. Front and side views of clay figurine (Mrn-124).
c. Figurine fragment from Mrn-80 (UCMA 1-166258).
d. Figurine fragment from Mrn-232 (UCMA 1-78156).
e. Same as above (UCMA 1-77872).
f. Figurine fragment from Mrn-80 (UCMA 1-166230).
g. Figurine fragment from Sac-6 (UCMA 1-85743).

Map 1: Archaeological Distribution of Human Figurines of Clay Beyond the Puebloan Southwest.

72. Desert Side-Notched Points as a Time Marker in California

M. A. Baumhoff and J. S. Byrne

Introduction

Chronological classification of archaeological resources is and must be based upon a foundation of minute typological distinctions, since we cannot know before the fact what properties of the material will ultimately prove to be of importance in chronological sorting.

One of the more valuable ways of dating archaeological remains is by means of the horizon marker. To be an effective horizon marker, an artifact type or style must have the two following properties: (1) it must be distinctive enough to be easily recognizable, and (2) it must have a position in the local chronology which is well established and which indicates that the type or style was in use for only a short time.

In Central California the most widely used horizon marker to date has been the clam shell disc bead, which is taken as the phase marker for Phase II of the Central California Late Horizon. This is a reliable marker for the Central Valley, but is less useful in other parts of the state because of its less frequent occurrence. Furthermore, it would be useful to have horizon or time markers of imperishable material because most archaeological sites are dated, tentatively at least, from surface collections, usually consisting exclusively of nonperishable items.

For the latter reason, and because of their relative abundance in California, projectile points obviously are desirable artifacts to serve as time markers. Projectile points have been commonly used, heretofore, as time markers by North American archaeologists. Such types, for example, as "Folsom," "Clovis," or "Pinto" points have not always been associated with otherwise well-defined cultural contexts, however, and, for the most part, the chronological position of these types is only imperfectly established.

The projectile point type proposed here as a time marker in California archaeology has long been recognized as distinctive. This projectile point type, sometimes called the Shoshone point, has recently been given the name "Desert Side-notched" by one of the present authors (Baumhoff, 1957, p. 10). The specimens to which this name applies are small projectile points, presumably arrow points, with triangular blades and side notches. The name

derives from the fact that these points are characteristic of late archaeological remains throughout the Desert West (Bennyhoff, 1958). The same type occurs also in the eastern United States but in its role as a California time marker a western name seems preferable for the type--for one thing, the present authors are not competent to deal with the type on a nation-wide basis, and in any case archaeologists in the eastern U. S. will probably prefer to use pottery types as time markers. The present effort is therefore mostly for the benefit of archaeologists in the western U. S., especially in the non-pottery areas of California and Nevada.

To establish the Desert Side-notched point as a significant type within California, we have catalogued all specimens of small, triangular, side-notched points to be found in the collections of the University of California Museum of Anthropology. Each specimen was recorded individually on a card containing data on dimensions (length, width, thickness, and weight), material, outline drawing, and provenience. The analysis of these data in the following pages proceeds through the following steps: (1) Spaulding's (1953) statistical test is applied to segregate possible subtypes. (2) Using this and other means, we are able to define subtypes of the Desert Side-notched point which we then organize according to site and stratigraphic provenience. (3) The final step is to plot geographic distribution and assign tentative dates to the subtypes.

Subtypes

A group of 606 specimens was catalogued from the collections of the U. C. Museum of Anthropology. The sample is not random, in the statistical sense, but is so large that we may assume it is representative. The lengths and weights were tabulated and a graph of each was drawn up (Fig. 1). Inspection of the graphs and specimens gave a breakdown into categories according to the following attributes: (a) material--obsidian and not of obsidian, lengths 0-22, 23-26, 27-32, over 33 mm.; (b) base--concave, V, and notched. (Weight was disregarded because of the great concentration in one area of the graph.) This gives 24 possible attribute combinations. Hence, the question to be answered is whether or not any of these combinations represent a subtype.

Counting the total number of specimens in each material category and calculating the percentage of the total for each, we have the following results:

	Number	Proportion
Obsidian	449	.7409
Not of obsidian	157	.2591

Next, the percentage of all specimens in each of the length categories is calculated:

Length category (mm.)	Number	Proportion
0-22	209	.3449
23-26	120	.1980
27-32	130	.2145
33+	147	.2426

Then the percentage of all specimens of the different base categories is calculated:

Base category	Number	Proportion
Concave	315	.5198
V	217	.3581
Notched	74	.1221

With this information we can arrive at an expected number of specimens that we should find in each category. This is done by multiplying the percentage of material by the percentage for each length category by the percentage for each base category. For instance, the first category given in Table 1 below is: Obsidian, 0-22 mm., Concave base. In this case, then, the calculation (P) would be: .7409 x .3449 x .5198 = .1328. This is converted into whole numbers by multiplying by the total number (606) of all the specimens examined, which gives an expected number (E) of 80.48.

Table 1

	P	E	O	d	d^2	pqk	$\frac{d^2}{pqk}$
Obsidian							
0-22 mm.							
Concave base	.1328	80.48	107	26.52	703.31	69.81	10.07
V base	.0915	55.45	44	-11.45	131.10	50.36	2.60
Notched base	.0312	18.90	32	13.10	171.61	18.30	9.38
23-26 mm.							
Concave base	.0763	46.24	47	.76	.58	42.72	.01
V Base	.0525	31.81	29	- 2.81	7.88	30.12	.26
Notched base	.0179	10.84	13	2.16	4.67	10.67	.44
27-32 mm.							
Concave base	.0826	50.05	44	- 6.05	36.60	45.93	.80
V Base	.0569	34.48	18	-16.48	271.59	32.54	8.35
Notched base	.0194	11.76	14	2.24	5.01	11.51	.44
33+ mm.							
Concave base	.0934	56.60	45	-11.60	134.56	51.33	2.62
V base	.0644	39.03	51	11.98	143.52	36.48	3.93
Notched base	.0219	13.27	5	- 8.27	68.39	12.97	5.27

Table 1 (continued)

	P	E	O	d	d^2	pqk	$\frac{d^2}{pqk}$
Not of obsidian							
0-22 mm.							
Concave base	.0465	28.18	16	-12.18	148.35	26.85	5.53
V base	.0319	19.33	5	-14.33	205.35	18.73	10.96
Notched base	.0109	6.61	5	- 1.61	2.59	6.54	.40
23-26 mm.							
Concave base	.0268	16.24	15	- 1.24	1.54	15.82	.10
V base	.0184	11.15	14	2.85	8.12	10.97	.74
Notched base	.0063	3.81	2	- 1.81	3.28	3.82	.86
27-32 mm.							
Concave base	.0288	17.45	27	9.55	91.20	16.97	5.37
V Base	.0199	12.06	25	12.94	167.44	11.82	14.17
Notched base	.0068	4.13	2	- 2.13	4.54	4.12	1.10
33+ mm.							
Concave base	.0326	19.79	14	- 5.79	33.52	19.09	1.76
V base	.0226	13.69	31	17.31	299.64	13.33	22.38
Notched base	.0078	4.73	1	- 3.73	13.91	4.67	2.98

The expected number is compared with the observed number (O) in the collection and the difference (d, which is O - E) noted. As can be seen, some of the numbers are negative. By squaring them all, the negative sign is removed and the differences between each class thus are accentuated.

In the sixth column of the table there is the combination pqk, in which p is the percentage (which we have in the first column: P), q is one (1) minus p (1 - p), or the percentage not expected to appear, and k is the total number of specimens, or 606. When multiplied together, they represent an estimate of the variance of the expanded binomial distribution. The standard deviation (σ) is computed as $\sqrt{pqk}$ and to convert this into units of standard deviation the formula $\frac{d^2}{pqk}$ is used (the last column in the table). $\frac{d^2}{pqk}$ is then approximately chi square with one degree of freedom, for which tables are readily obtainable. The use of these tables will tell the probability of the points in this category being made by chance alone. For example, in our first category we have a $\frac{d^2}{pqk}$ of 10.07. Entering the tables for one degree of freedom, we find a proba- of .001 or a chance of 1 in 1,000 of its being made by chance.

By using a probability of .01 or less (a $\frac{d^2}{pqk}$ of 6.635 or larger), six categories stand out, as follows:

Table 2

	$\frac{d^2}{pqk}$
Obsidian	
0-22 mm.	
Concave base	10.07
Notched base	9.38
27-32 mm.	
V base	8.35
Not of obsidian	
0-22 mm.	
V base	10.96
27-32 mm.	
V base	14.17
33+ mm.	
V base	22.38

Of the six categories of projectile points in Table 2, two have negative coefficients, indicating that in these cases the three qualities are not often found in the same specimen. The two negative categories are: (1) obsidian points with V-shaped bases from 27 to 32 mm. in length, and (2) points not of obsidian, with V-shaped bases, and less than 22 mm. in length.

The other four categories occur together more often than one would expect by chance alone. These categories are:

1. Obsidian points, 0-22 mm. long, with concave bases.
2. Obsidian points, 0-22 mm. long, with notched bases.
3. Points not of obsidian, 27-32 mm. long, with V-shaped bases.
4. Points not of obsidian, 33+ mm. long, with V-shaped bases.

We presume that these categories correspond, in some measure, to historically discrete subtypes of the Desert Side-notched point with areal and/or temporal distinctions. However, we do not choose to designate these categories themselves as subtypes. For one thing, to accept only these categories as subtypes would mean that there would exist certain specimens which could not be assigned a subtype. For example, an obsidian point with concave base,

24 mm. in length, would be included in none of the categories. For this reason, we have combined certain minor categories with the ones specified above to define the subtypes. In addition, categories 3 and 4 above have been combined to form a single subtype since these categories differ only in length, and also because the specimens found in the two categories completely overlap in geographical distribution.

One further subtype has been segregated. This is characterized by a bell-shaped base, by material nearly always of obsidian, and particularly by its "comma" shaped notches. The length of this subtype is quite variable. We had been aware of the possibility that such a subtype existed when the statistical analysis was made. It was thought then that the differentiating characteristic of this subtype was a concave blade, giving the point a long thin tip (Pl. 1w). In the initial statistical analysis, therefore, the specimens were classified according to whether their blades were convex or concave. This characteristic turned out to have no significant correlation with other characteristics, and it was therefore excluded in the final tabulation. Even though this subtype was obtained by intuition rather than by statistical method, we have every confidence in its reality as a distinct historical growth. Its small, well-defined distribution bears out our feeling on this matter.

By the foregoing methods, partly statistical and partly intuitive, we have obtained four subtypes of the Desert Side-notched point, described in the following paragraphs. That these categories have historical reality as subtypes is confirmed, it is felt, by their well-defined areal distribution and by their consistent chronological associations throughout the state. Each subtype had at least three defining characteristics. For a specimen to have been included in any subtype, we required that it have at least two of the three defining characteristics. Even with this requirement, it was found that there were some aberrant specimens in each category, for example, a "long" specimen would have to be placed in an otherwise short category (cf. Pl. 1f). Fortunately, there were only a few of these aberrations.

1. General subtype (Pl. 1a-f)*

Defining characteristics: Material, obsidian; length, 0-26 mm.; base, concave.

This is the most variable of all the subtypes and also the most widespread; hence its name. There may actually be several subtypes included here which we are unable to distinguish because of the sample.

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*Pl. 1 follows p. 40. (N.B.: Explanation of Pl. 1 is on p. 65.)

2. Sierra subtype (Pl. 1g-k)

Defining characteristics: material, obsidian; length, 0-26 mm.; base, notched.

This subtype is less variable than the preceding. It is called the Sierra subtype because it is characteristic of the High Sierra region of California. It is also common, however, in the Great Basin and in the Southwest.

3. Delta subtype (Pl. 1m-r)

Defining characteristics: material, not obsidian (usually of varicolored cherts and jaspers); length, 27+ mm.; base, V-shaped.

This subtype is so named because it is most commonly found in the delta region of the Sacramento-San Joaquin Rivers. The V-shaped bases of these specimens are usually isosceles triangles with base angles of 45 degrees or more.

4. Redding subtype (Pl. 1s-x)

Defining characteristics: material, obsidian; length, variable; base, bell-shaped; notches, comma-shaped.

The subtype is named from the fact that the city of Redding is near the center of its distribution. Although the Redding subtype is variable in length, it is the most easily recognized of the subtypes because of its bell-shaped base and especially because of the shape of its notches.

Two other categories of artifacts must be mentioned even though they are not included in the present study. One of these is a species of large blade found in the Delta region, the shape or form of which is obviously modeled on that of the Desert Side-notched point. The practice of making these large, presumably ceremonial blades was common in the Delta region throughout Phase II of the Late Horizon times. At least one of these objects is made of bone (Bennyhoff, 1957), indicating that its function is probably different from that of ordinary Desert Side-notched points. Since these objects are presumably not projectile points, they have not been formally included in the present study. Their presence, however, indicates a knowledge of Desert Side-notched points and they have therefore been referred to for dating purposes.

These large blades were included in our statistical analysis (accounting

for the long right-hand tails on the graphs shown in Fig. 1) but are excluded from the following distributional analysis. They could actually have been included as subtypes, but are excluded because they obviously did not function as projectile points.

Table 3 is a list of the sites from which these blades are derived.

Table 3

Site (by county)	No. of specimens
Lassen	
General	3
Sacramento	
6 (Johnson)	10
28 (Strawberry)	2
31 (Joe 1)	1
56 (Mosher)	2
95 (Allyn 2)	4
San Joaquin	
43 (Tracy Lake)	2
80 (Stockton Channel)	2
82 (Walker Slough)	2
86 (Pool)	3
91	1
105	1
Solano	
2 (Peterson 2)	1

The other category of artifact that must be mentioned is a type of projectile point that looks very much like the Desert Side-notched point, except that it is much larger. This kind of point is found in Great Basin sites at a much earlier time than the Desert Side-notched (Jennings, 1957, p. 121; Cressman, 1956, Fig. 45, type 7A). This large side-notched point is also found in northeastern California (at the Karlo site [Las-7], for example) but has been excluded from consideration in the present paper.

There is a possibility that this large side-notched point is the prototype of the Desert Side-notched point. We might imagine, for example, that some group of people were using these large side-notched points at a time when they first became aware of the idea of the bow and arrow. They

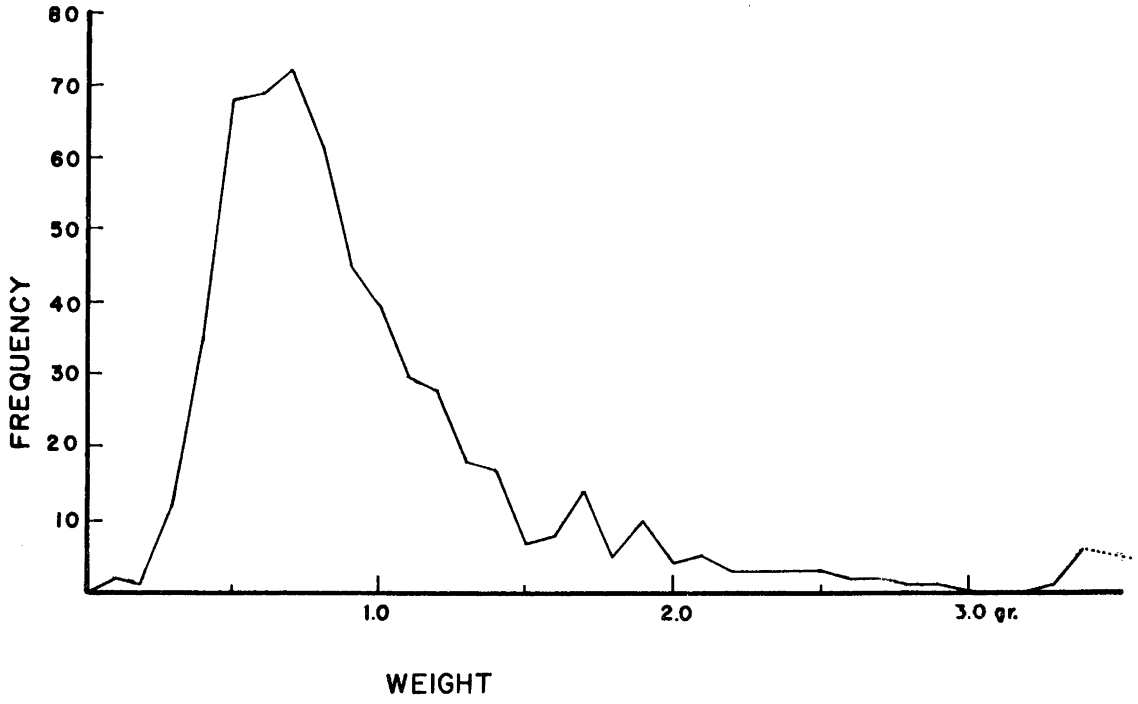
then began to make arrow points and in doing so used the form with which they were already familiar. We do not know that this is the case, however, but suggest it as a possible explanation of the similarity of form between the Desert Side-notched point and these larger, earlier, side-notched points.

Sites

The record of occurrence of each of the subtypes in various northern California archaeological sites, so far as it is shown by the present data, is given in Table 4. In the paragraphs that follow, the important sites are discussed individually in order to determine the temporal relationships of the subtypes.

Table 4

Site (by county)	Subtype			
	General	Sierra	Delta	Redding
Calaveras				
114 (Hospital)	3	-	8	-
141	1	-	-	-
142 (Poore)	2	-	-	-
143	-	-	1	-
Colusa				
2 (Howells Point)	1	-	-	-
Contra Costa				
138 (Hotchkiss)	3	-	3	-
El Dorado				
24 (Cathedral Rock)	4	2	1	-
Fresno				
7	1	-	-	-
27 (Pine Flat)	2	-	-	-
115 (Vermilion Valley)	6	5	-	-
118 (Badger Flats)	-	1	-	-
123 (Sly)	5	1	-	-
133	1	1	-	-
137 (Rattlesnake Creek)	1	-	-	-
140	1	-	-	-
141	-	1	-	-
142	1	-	-	-
152 (Round Meadow)	-	1	-	-



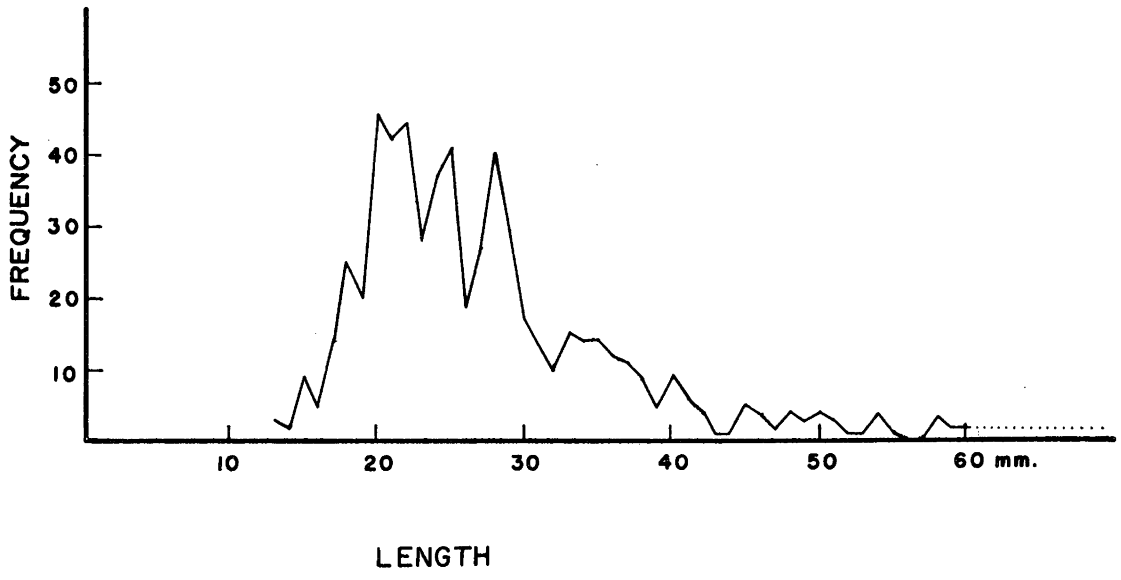
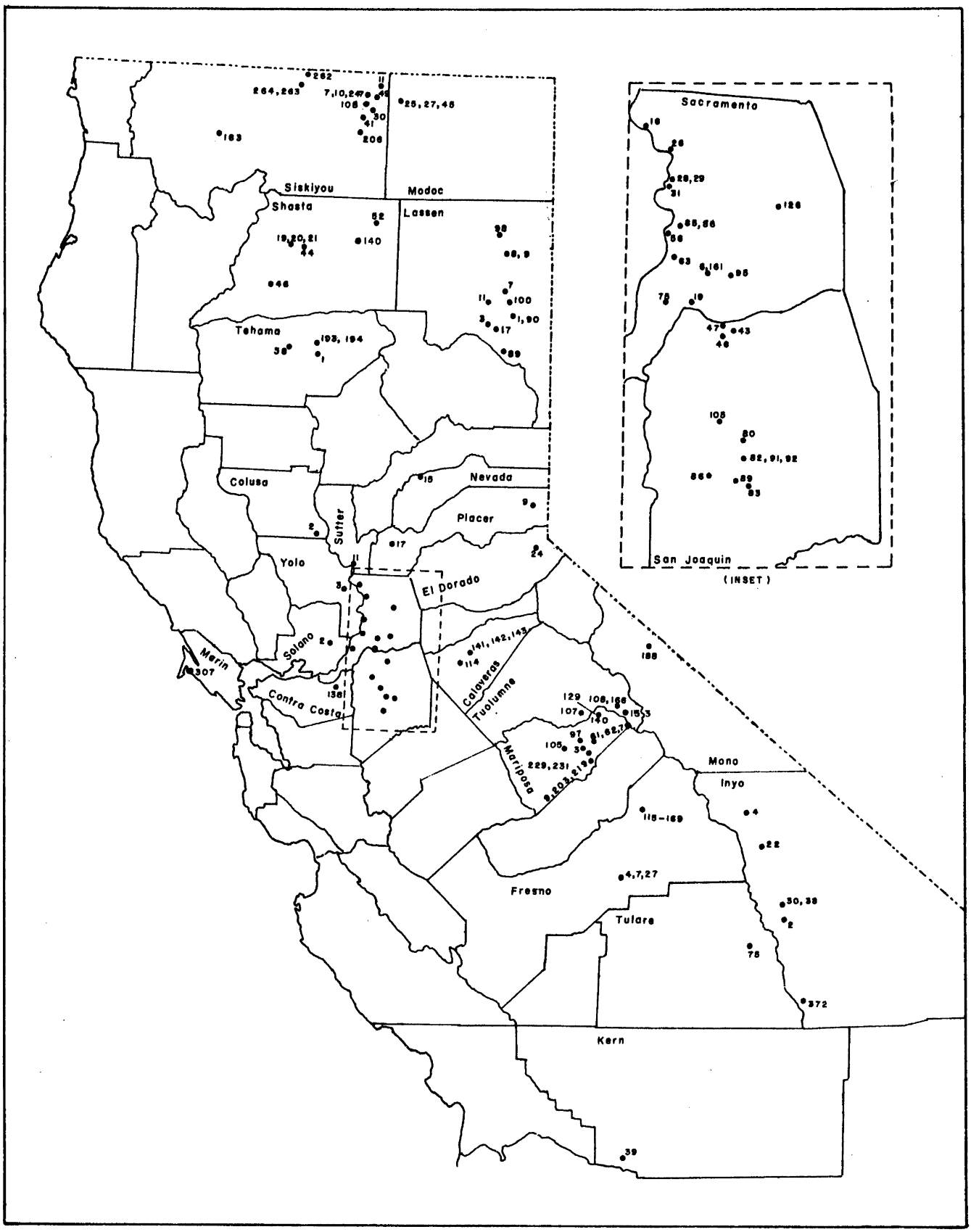
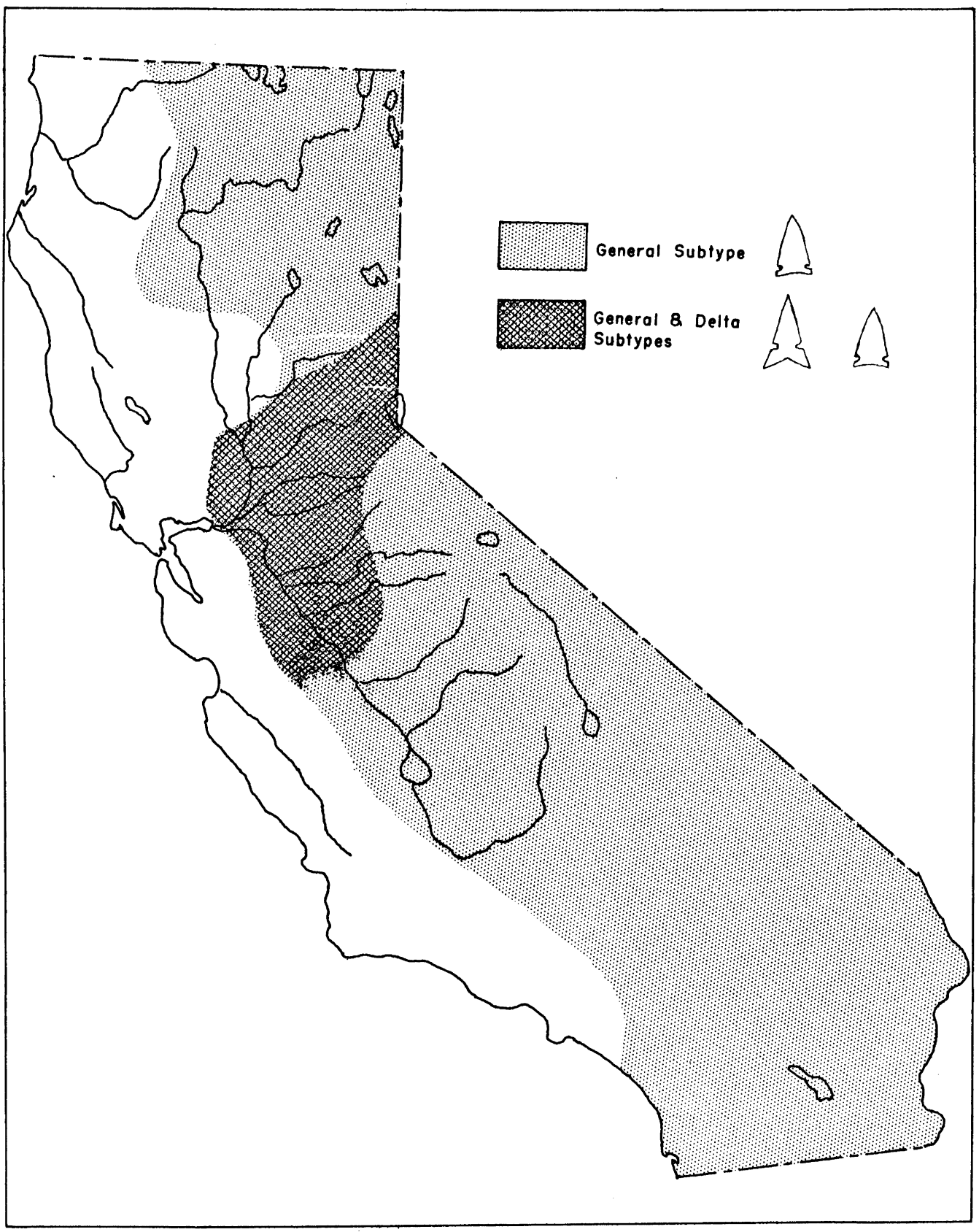


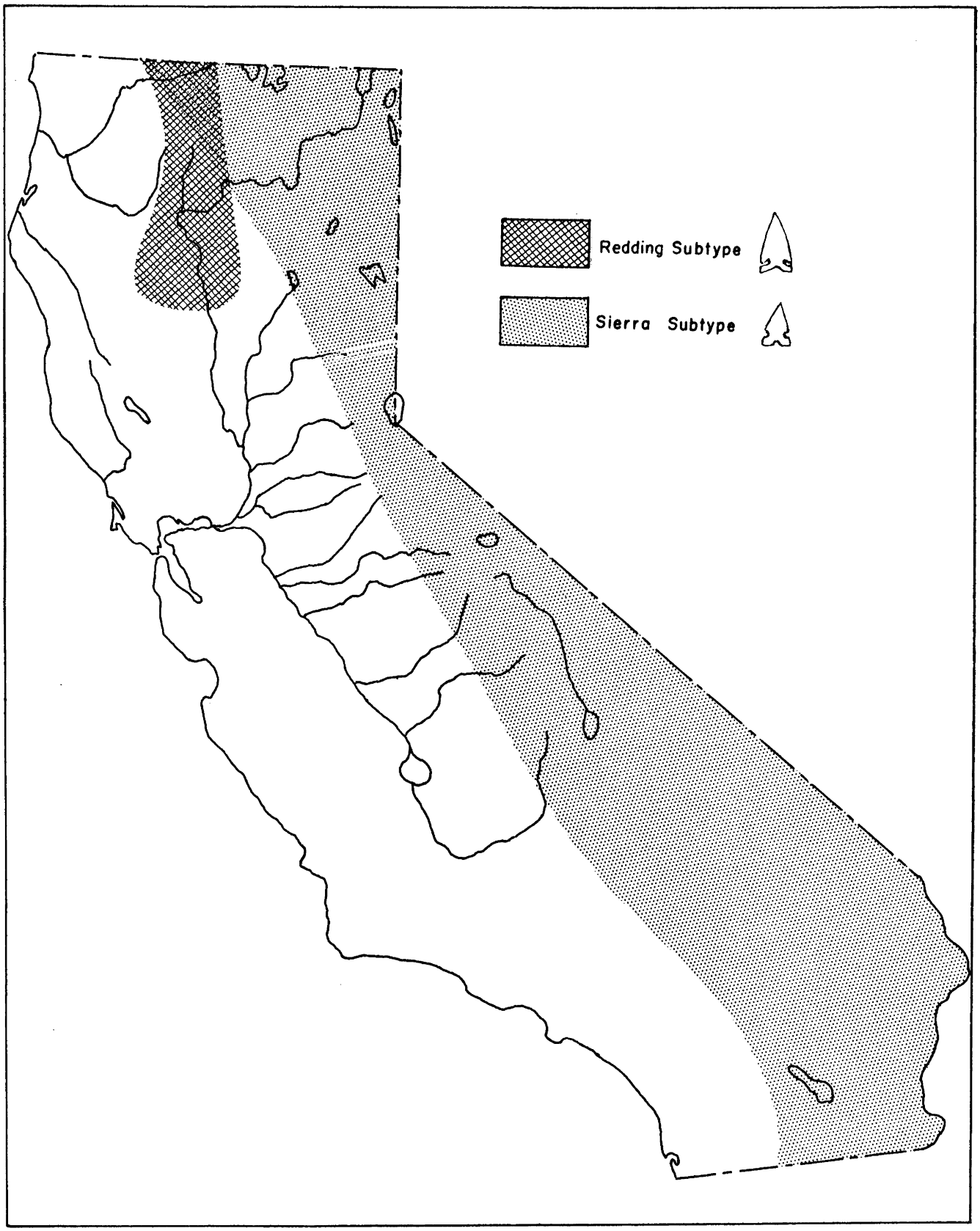
Figure 1. Frequency Distribution of Weights and Lengths of Desert Side-Notched Projectile Points



Map I. Archaeological Sites Producing Desert Side-notched Points



Map 2. Distribution of Desert Side-notched Points, General & Delta Subtypes.



Map 3. Distribution of Desert Side-notched Points, Sierra & Redding Subtypes.

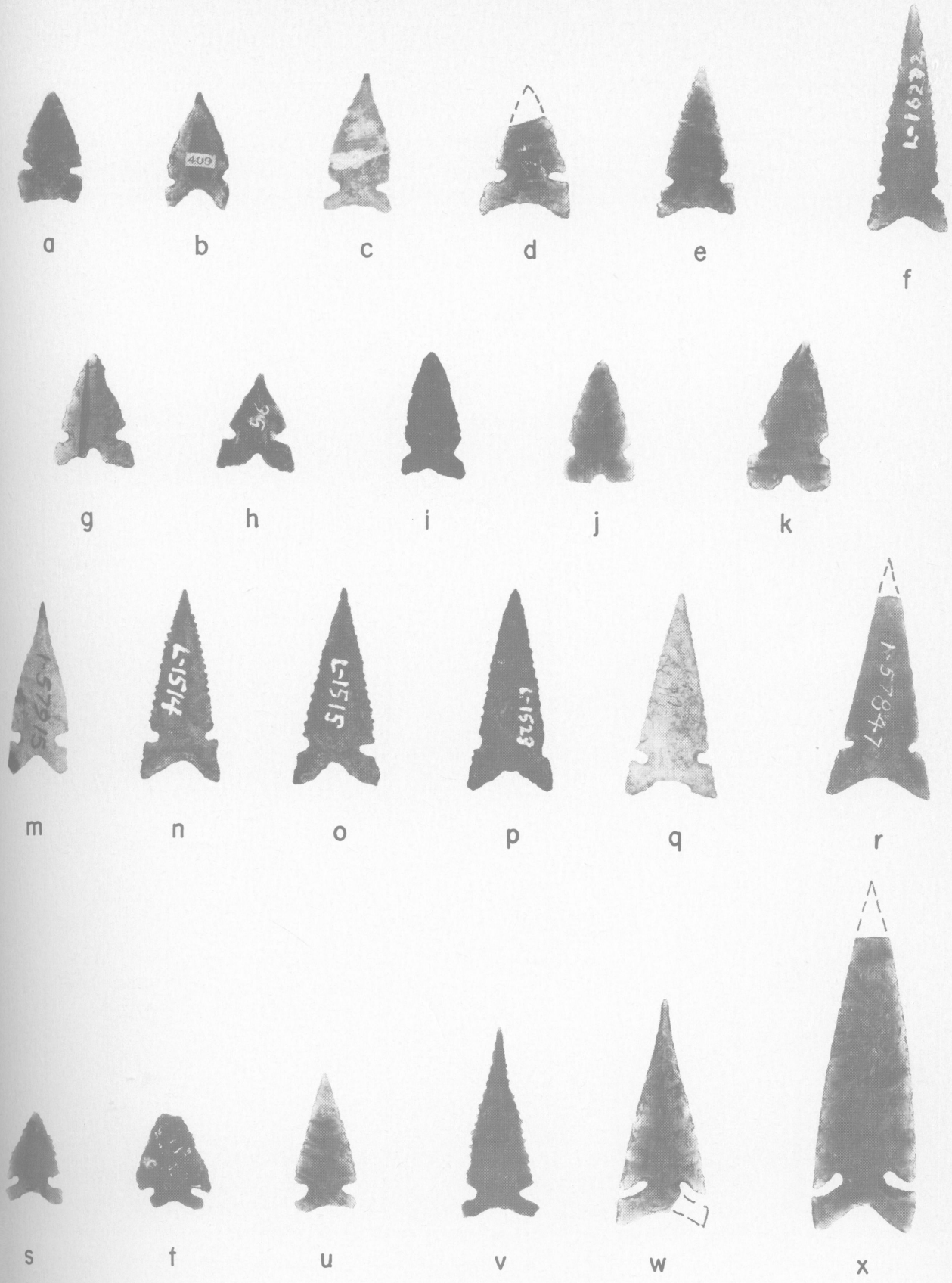


Plate I

Table 4 (continued)

Site (by county)	Subtype			
	General	Sierra	Delta	Redding
Fresno				
161	3	1	-	-
169	-	1	-	-
Inyo				
2	15	5	-	-
4	1	-	-	-
22	1	-	-	-
30	-	1	-	-
38	1	-	-	-
372 (Rose Springs)	5	3	-	-
Kern				
39 (Buena Vista Lake)	X*	-	X*	-
Lassen				
General	38	21	2	-
1 (Tommy Tucker Cave)	-	-	1	-
3	1	-	-	-
7 (Karlo)	7	2	-	-
8	-	1	-	-
9	-	1	-	-
11	-	2	1	-
17	1	-	-	-
89	1	-	-	-
90 (Amedee Cave)	3	3	-	-
98	-	1	-	-
100	1	-	-	-
Marin				
307	1	-	-	-
Mariposa				
3 (Big Meadows)	2	-	-	-
9	4	2	-	-
61	5	3	-	-
62	2	1	-	-
79	-	1	-	-
97	1	-	-	-
105	9	4	-	-
129	1	-	-	-

* Present but not counted.

Table 4 (continued)

Site (by county)	Subtype			
	General	Sierra	Delta	Redding
Mariposa				
140	1	-	-	-
203	1	-	-	-
219	1	-	-	-
229	-	1	-	-
231	1	-	-	-
Modoc				
25	-	1	-	-
27	10	4	-	-
45	1	-	-	-
Mono				
188	-	1	-	-
Nevada				
15 (North San Juan)	5	-	1	-
Placer				
Lincoln site	5	-	31	-
9 (Kings Beach)	1	-	3	-
17	1	-	3	-
Sacramento				
6 (Johnson)	46	-	75	-
16 (Bennett)	3	-	4	-
19 (Old Crump)	-	-	2	-
28 (Strawberry)	1	-	6	-
29 (King Brown 1)	-	-	4	-
31 (Joe 1)	2	-	3	-
56 (Mosher)	-	-	2	-
63 (Bloom)	1	2	-	-
75 (Locke)	1	-	-	-
85 (Nicolaus 2)	-	-	2	-
86 (Nicolaus 4)	1	-	1	-
95 (Allyn 2)	-	-	1	-
127 (Augustine)	-	-	1	-
161 (Little Johnson)	1	-	-	-
San Joaquin				
43 (Tracy Lake)	5	-	6	-
46 (Smith)	1	-	-	-
47 (McCauley)	1	-	3	-

Table 4 (continued)

Site (by county)	Subtype			
	General	Sierra	Delta	Redding
San Joaquin				
80 (Stockton Channel)	12	-	14	-
82 (Walker Slough)	6	-	7	-
83 (Ott)	4	-	5	-
86 (Pool)	-	-	2	-
89 (Brants Ferry)	-	-	2	-
91	1	-	4	-
92	1	-	-	-
105	-	-	3	-
Roberts Island (?)	1	-	2	-
Shasta				
19 (McCloud 19)	-	-	-	1
20 (McCloud 20)	21	-	-	23
21 (McCloud 21)	1	-	-	-
44	3	-	-	1
46	X*	-	-	X*
52 (Callison)	6	7	-	-
140	-	-	-	1
Siskiyou				
7 (Canby's Crossing)	15	7	-	-
10 (Fleming Island)	21	10	-	-
11 (Oklahoma Landing)	18	3	-	-
30	1	-	-	-
41 (Upper Ice Cave)	-	1	-	-
49	-	1	-	-
108	1	-	-	-
163	1	-	-	-
206	1	-	-	-
247	-	1	-	-
262 (Foster)	5	-	-	1
263	1	-	-	-
264	2	-	-	1
Solano				
2 (Peterson 2)	-	-	1	-
Sutter				
11 (Vernon)	1	-	5	-

* Present but not counted.

Table 4 (continued)

Site (by county)	Subtype			
	General	Sierra	Delta	Redding
Tehama				
1 (Kingsley Cave)	6	1	-	1
58 (Redbank)	14	1	-	27
193 (Payne Cave)	3	-	-	9
194	-	-	-	1
Tulare				
75	5	2	-	-
Tuolumne				
General	10	9	-	-
107	-	1	-	-
108	-	2	-	-
153	1	-	-	-
166	7	1	-	-

Calaveras County

The four sites in Calaveras County represented in the collections are all in the foothill region at altitudes of 2000 to 3000 feet. It is apparently feasible to work out a sequence of subtypes here. The late end of the sequence is evident at the Hospital Site (Cal-114), where the projectile points nearly all come from a single late cemetery. The same cemetery produced a quantity of shell artifacts, including numerous clam shell disc beads as well as abalone ornaments which evidently derive from the protohistoric period, not more than a hundred years before white contact (J. A. Bennyhoff, personal communication). The projectile points, predominantly of the Delta subtype, therefore represent the latest part of the sequence.

The two specimens from the Poore Site (Cal-142), both of the General subtype, are from the top six inches of a midden which produced, at all levels, projectile points typical of Late Horizon, Phase I in the Central Valley. Since no artifacts from the site, aside from the two Desert Side-notched points, are characteristic of Phase II, we may conclude that the two points represent terminal Phase I or beginning Phase II times.

The evidence from these two Calaveras sites, then, suggests that the General subtype was introduced into Calaveras County about 1500 A.D., or

slightly earlier, and the Delta subtype came into the region, probably from the Central Valley, around 1700 or 1800 A.D.

It is perhaps worthwhile to note that the Sierra subtype did not occur at these sites, indicating that this subtype did not go west of the High Sierra in the latitude of Calaveras County.

Colusa County

Desert Side-notched points are found at but one site in Colusa County, Howells Point Site (Col-2). It is surprising that only one specimen was recovered from the site, in spite of the fact that it represents a full Phase II settlement, with an abundance of clam shell disc beads (cf. Lillard, Heizer and Fenenga, 1939, p. 69). Many projectile points have been recovered from the site besides that of the Desert Side-notched type, indicating that southern Colusa County is about the northern limit of the spread of this projectile point type from the Delta region. Col-2 yields the firmest evidence of a gap in the distribution of the type within the Sacramento Valley, since there are no further occurrences to the north between Howells Point and Red Bluff, which is the southernmost extension of the known distribution of another subtype of Desert Side-notched point, the Redding subtype.

Contra Costa County

The only specimens of Desert Side-notched points from Contra Costa County are from the Hotchkiss Site (CCo-138). All specimens with known provenience come from Phase II burials or from what is evidently Phase II midden, and thus from the period since 1500 A.D. The specimens found at CCo-138 represent the westernmost occurrence of the type in Central California, except for a single example from Marin County. Thus the Desert Side-notched point is essentially limited to the Delta province of Central California Late Horizon, the Hotchkiss Site being the westernmost site of this province.

El Dorado County

The single site representing this county is Cathedral Rock Site (Eld-24), a pure representative of the Kings Beach Complex (Heizer and Elsasser, 1953). The occurrence of a point of the Delta subtype at the site suggests that this subtype extends over the Sierra Nevada at this latitude into the territory of the Washo.

Fresno County

Fresno County specimens have been obtained from two distinct regions,

the foothills and the high mountains. Sites Fre-7 and 27, for example, are in the foothills at an elevation of about 2000 to 2500 feet, while the other sites are at elevations greater than 5000 feet.

That the three specimens from the foothills are of the General subtype, while the Sierra subtype is confined to the high elevations, is consistent with the distribution of the Sierra subtype farther north in the Sierra Nevada, where it likewise seems never to occur below about 5000 feet. Fre-27, a site in the territory of the ethnographic Yokuts, has been excavated and considerable pottery was obtained there, so that the relationship of Desert Side-notched points with respect to Yokuts ceramics may be indicated.

Table 5

Potsherds and Desert Side-notched Points at Fre-27

Level (in.)	Potsherds	Desert Side-notched Points
0-12	173	1
12-24	7	-
24-36	1	-
36-48	-	1

It will be observed that while the pottery is essentially confined to the topmost one foot of the deposit, one of the two Desert Side-notched points was obtained from a considerable depth (42 in.) This suggests that these points may pre-date the use of pottery at the site.

Taking the sites at higher elevations (Fre-115 through 169) as a group, the ratio of points of General subtype to points of Sierra subtype is 3:2. At the Vermilion Valley Site (Fre-115), however, the ratio is 6:5. Since this site represents the full historic period (Lathrap and Shutler, 1955), while some of the other sites presumably represent prehistoric times, the inference is, as it is elsewhere in the Sierra Nevada, that the Sierra subtype is slightly later than the General subtype.

Inyo County

Two of the Inyo County sites producing Desert Side-notched points have been excavated; the other specimens have come from surface collections.

One excavated site is Iny-2 (H. S. Riddell, 1951), which produced the following data:

Table 6

Potsherds and Desert Side-notched Points at Iny-2

Level (in.)	Potsherds	Desert Side-notched	
		General	Sierra
Surface	ca. 750	12	5
0-6	189	1	-
6-12	23	1	-
12-18	2	1	-

This stratigraphy also suggests that the General subtype is slightly older than the Sierra subtype. Since the quantity of pottery drops off very rapidly below a depth of six inches, the evidence suggests, in addition, that the General subtype predates the introduction of pottery by a short time.

The general ideas derived from Iny-2 are supported by the stratigraphic details of the Rose Springs Site (Iny-372) excavated by F. A. Riddell (1958, p. 42).

Table 7

Potsherds and Desert Side-Notched Points at Iny-372

Level (in.)	Potsherds	Desert Side-notched	
		General	Sierra
0-12	74	2	2
12-24	11	3	1
24-36	1	-	-

Again the General subtype seems to be slightly older than the Sierra subtype, and again we see that, although the quantity of pottery drops off below the twelve inch level, the number of Desert Side-notched points is just as great in the 12-24 inch level as it is in the 0-12 inch level.

Kern County

The only Desert Side-notched points from Kern County are reported from the Buena Vista Lake excavations (Wedel, 1941). At one of the sites excavated, eighteen of these points were recovered (out of a total of about three hundred and fifty points). From Wedel's illustrations it would appear that both the General and Delta subtypes are present in the collections, but it is not known how many of each. Only about 6 percent of the total collection of points from this site are of obsidian, while 44 percent of the Desert Side-notched points are of that material. These proportions suggest that the Desert Side-notched points found at the site were due either to trade or to influence from the east (perhaps from Inyo County) where obsidian is found more commonly.

The Desert Side-notched points were confined to the top four feet of the deposit at Ker-39 (Wedel's Site 1; cf. Wedel, 1941, Table 8. The type is Wedel's NBb1), while glass beads and iron fragments were found in the upper three feet of the deposit. This stratigraphy indicates that Desert Side-notched points were probably present only during about the last hundred years of the prehistoric period.

Lassen County

The collections from Lassen County contain many specimens with specific site provenience, in addition to a great number in one group known to be from Lassen County but which probably come from different sites (from the collection of Mr. Otto Hansen of Susanville, Calif.). The general collection, and the specific site collections as well, have been tabulated to show the relatively high proportion of Sierra subtype specimens that are found in this county. This subtype approaches 50 percent of all Desert Side-notched points from Lassen County, the highest percentage for any county.

Several of the individual site collections are of interest from the dating standpoint. Tommy Tucker Cave (Las-1) produced a single Desert Side-notched specimen, hafted to a juniper foreshaft, which was inserted into a heavy cane arrow (Fenenga and Riddell, 1949, Fig. 58s). The arrow, with Desert Side-notched point attached, was found in Room 1 at a depth of 20-40 inches. In the same room were found shell beads of types (3d, 3b1, 3a2) which in Central California indicate Late Horizon times (Bennyhoff and Heizer, 1958, pp. 67, 85). Whether the Desert Side-notched point is to be attributed to the earlier or later part of the Late Horizon cannot be settled on the basis of the single specimen.

The Karlo Site (Las-7) has produced nine Desert Side-notched points out

of a total of several hundred projectile points recovered there. Although this site produced materials almost certainly of considerable antiquity (Riddell, 1956, Fig. 14), it is felt that the Desert Side-notched points represent the protohistoric Northern Paiute and thus are only a few hundred years old at most (ibid, p. 68).

Elsewhere in Lassen County, the Desert Side-notched point is known to occur only with the latest culture. Six of these points were recovered at Amedee Cave (Las-90) which Riddell (op. cit., Fig. 14) dates as post-1000 A.D. Again, a specimen from Las-3 was found with several pieces of pottery, indicating that it must be very late in time.

The burden of evidence, then, is that the Desert Side-notched point is late in Lassen County as it is elsewhere in California, probably beginning after 1200 A.D. In Lassen County, however, none of the excavated collections reveal the stratigraphic relationships of the subtypes of Desert Side-notched points.

Marin County

Only one Desert Side-notched specimen has been found to date in Marin County, that from Mrn-307. This site produced iron spikes which are thought to derive from the wreck of Cermeño's ship, the San Augustin, in 1595 (Meighan and Heizer, 1952, p. 104). From the same site, but occurring at a greater average depth than the iron spikes, come fragments of stoneware which may be derived from the visit of Sir Francis Drake to the California coast in 1579. The Desert Side-notched point was recovered at a depth of 21 inches (the average depth of the stoneware is 21 in.). The point may therefore be dated to the middle of the sixteenth century.

Mariposa and Tuolomne Counties

These two counties are considered together because all occurrences of Desert Side-notched points from the two counties are from Yosemite National Park and are reported by Bennyhoff (1956). The proportions of subtypes in the Yosemite area seem to be typical for the Central Sierra Nevada. There are sixty-two specimens of the General subtype and forty-four specimens of the Sierra subtype. There is also some evidence of the temporal relationships of the subtypes here since stratigraphic excavations were carried out at several sites. The table following indicates the stratigraphic relationships between the subtypes. These relationships suggest that the General subtype precedes the Sierra subtype in the Yosemite region.

Table 8

Desert Side-notched Points at Mrp-9 and Mrp-105

Level (in.)	Mrp-9		Mrp-105	
	General	Sierra	General	Sierra
Surface	1	2	-	1
0-6	1	-	4	1
6-12	2	-	3	2
12-18	-	-	-	-
. . . . .	. . . .	. . . . .	. . . . .	. .
36-42	-	-	1	-

Bennyhoff uses the Desert Side-notched point as a marker for his Mariposa Complex, the latest cultural complex found in the Yosemite region. His suggested beginning date for this complex is 1200 A.D.

Modoc County

The specimens of Desert Side-notched points from Modoc County all come from the survey and excavation performed there by R. J. Squier and Gordon Grosscup (Squier, 1956). The major excavated site in the area is Mod-27. According to Squier (personal communication), the cultural remains at this site are to be attributed entirely to his Tule Lake Phase which he dates at post-1500 A.D. In the surface collections and excavations from here and from neighboring parts of Siskiyou County, no Desert Side-notched points are known to be associated with Squier's earlier Gillem Bluff or Indian Bank phases.

Mono County

Only one Desert Side-notched point is recorded as having come from Mono County, in spite of the fact that Meighan (1955) has carried out a rather extensive survey in the area. Two pottery-producing sites were investigated by Meighan but no projectile points were found (ibid., p. 12). It must be concluded that the majority of the sites visited represented something other than the latest local culture. Desert Side-notched points are the most abundant projectile points of the latest cultures in Inyo County to the south and in the high Sierra to the west. It is hardly conceivable that they were not present in Mono County, and additional investigation should be made to settle this point.

Nevada County

The only specimens from Nevada County come from site Nev-15, excavated by R. F. Heizer. The site is shallow and probably the midden soil is badly mixed. The major part of the collection from the site shows affinities to the Martis Complex, but a few specimens, including the Desert Side-notched points, show a similarity to Heizer and Elsasser's later Kings Beach complex.

It is noteworthy that one of the points recovered at Nev-15 was of the Delta subtype, indicating the influence of this subtype well up into the mountains at this latitude.

Placer County

The Desert Side-notched specimens from Placer County are partly from the Central Valley (Lincoln Mound and Pla-17) and partly from the high Sierra (Pla-9). Specimens from the Lincoln Mound (part of the Lillard collection; the site has never been relocated and so remains unnumbered) and from Pla-17 (also near the town of Lincoln) bear a marked resemblance to specimens from the Delta sites farther south in the Sacramento Valley. This is, in fact, the most northerly extension of the area of the Delta subtype, which is most common in the Sacramento-Stockton region.

Site Pla-9 is on the northern shore of Lake Tahoe and is typical of the Kings Beach Complex (Heizer and Elsasser, op. cit.). The fact that the Delta subtype also occurs at this site indicates that the subtype extends eastward over the mountains at the latitude of Lake Tahoe (note that the Delta subtype also occurs at Nev-15). The points made by the historic Washo are of the Delta subtype (ibid., Fig. 1r-v), indicating a continuous distribution from the Washo, through the Maidu, Plains Miwok, and into Yokuts territory.

Sacramento and San Joaquin Counties

These two counties have produced more Desert Side-notched specimens than any other area of comparable size in the state. The sites from these counties which are susceptible to placement in the cultural sequence of the Delta region are listed below. We are indebted to J. A. Bennyhoff for most of this information.

Table 9

Desert Side-notched Points in Delta Region, Central California

	Subtype		Cultural Placement (Phase I and Phase II refer only to Late Horizon)
	General	Delta	
Sac-6	46	75	Phase II and Phase I (see below for stratigraphic details).
Sac-16	3	4	Middle Horizon through Phase II of Late Horizon.
Sac-28	1	6	Site is Phase I and Phase II. Four points of Delta subtype are from Phase II burials.
Sac-29	-	4	Three specimens from historic burial, one specimen from a definite Phase I burial (deeper than other Phase I burials and associated with Phase I serrated points.
Sac-31	2	3	Dominantly historic but may also have earlier components.
Sac-56	-	2	Site nearly all Phase II or historic.
Sac-95	-	1	Phase II.
Sac-127	-	1	Site was occupied from Middle Horizon to historic times.
Sac-161	1	-	Terminal Phase I and Phase II are represented at the site.
SJo-43	5	6	Dominantly Phase II with some late Phase I.
SJo-47	1	3	Phase II, Phase I, and Middle components.
SJo-80	12	14	Very late Phase II, and probably historic.
SJo-82	6	7	Historic, Phase II, and rare Phase I material.
SJo-83	4	-	Dominantly Phase II, but with some Phase I-Phase II transitional material also present.
SJo-86	-	2	Both specimens found with late Phase II or historic burials.
SJo-91	1	4	Late Phase I and beginning Phase II. The specimens of General subtype were found with clam shell disc beads.

We add here the stratigraphic details of the specimens from the Johnson Mound (Sac-6). Six specimens came from burials or features, as follows:

Burial 43 (Phase II) - 1 specimen, General subtype.
Burial 52 (Phase II) - 1 specimen, Delta subtype.
Burial 66 - 1 specimen, General subtype. The burial is definitely Phase I, but the association of the projectile point is questionable.
Feature 5 - 3 specimens, Delta subtype, found at a depth of 5 inches and therefore presumably from historic or Phase II times.

The record of occurrence of the specimens found unassociated in the midden of the Johnson Mound is given in the following table and, for comparative purposes, the occurrences of clam shell disc beads found in the midden is also given. For stratigraphic purposes the site has been divided into north and south sections. The clam shell disc beads, and therefore the Phase II occupation, have a much greater average depth in the northern portion of the site. The single deep occurrences of clam shell disc beads are from a pit in the southeast corner of the site (pit T-7). None of the Desert Side-notched points are from this pit.

Table 10

Depths of Desert Side-notched Points and Clam Shell Disc Beads in Midden Deposit of Johnson Mound (Sac-6)

Level (in.)	South Section			North Section		
	Clam Shell Disc Beads	Desert Side-notched points		Clam Shell Disc Beads	Desert Side-notched points	
		General	Delta		General	Delta
0-12	16	1	1	19	2	4
12-24	10	1	1	14	2	5
24-36	1	1	2	14	1	-
36-48	-	-	1	1	-	1
48-60	-	-	-	2	-	-
60-72	-	-	-	-	-	1
72-84	-	-	-	-	-	-
84-96	2	-	-	-	-	-

The burden of evidence from Sacramento and San Joaquin Counties is that the Desert Side-notched point is predominantly associated with the Late Horizon, Phase II culture. No clear decision is possible as to whether these

points are also to be attributed to Phase I components. At site Sac-29 we have the only specimen to be associated definitely with a Phase I burial. At the Johnson Mound (Sac-6), the specimens found unassociated in the midden were slightly deeper than clam shell disc beads in the southern section of the site, but in the northern section were not quite so deep.

Only one other bit of evidence argues for Phase I dating of Desert Side-notched points. From the Johnson Mound comes a large antler point, described by Bennyhoff (1957), the form of which seems obviously to have been influenced by the form of Desert Side-notched points. The specimen was found unassociated in the midden at a depth of 40 inches in the eastern section of the site. Clam shell disc beads were found only in the topmost 12 inches of the trench from which the specimen was recovered, suggesting that the antler point was manufactured during Phase I times.

Summarizing, it seems that there are only two unequivocal Phase I occurrences of Desert Side-notched points in the Delta region. We are therefore justified in concluding that the inception of the type in this region was in the terminal Phase I period or beginning Phase II period. Any site component which produces this kind of projectile point in quantity must be considered, on these grounds alone, to represent Phase II of the Late Horizon.

The relationship of the Delta subtype and the General subtype in Sacramento and San Joaquin Counties poses a difficult question. The stratigraphic evidence from the Johnson Mound suggests that the Delta subtype is slightly earlier than the General subtype. On the other hand, the General subtype is known to have originated east of California while the Delta subtype is presumably a Californian specialization and is therefore later. Weighing all the evidence, we are inclined to deemphasize at present the stratigraphic occurrences at the Johnson Mound, and to conclude that the Delta subtype was developed soon after the peoples of the region acquired knowledge of the General subtype.

One other problem of the specimens from Sacramento and San Joaquin Counties is presented by the materials of which the Desert Side-notched points are made. A majority of the specimens are of vari-colored cherts, although a sizable minority is of obsidian. The chert used for these specimens seems never to be of the Franciscan variety which is found in the coast ranges to the west. Since no chert occurs in the Delta region itself, it must be concluded that either the material or the points themselves were traded in from the east. If the material was acquired from the east and points were made locally, we would expect to find chipping debris in the sites in the form of small flakes of chert. Cook and Treganza (1950, Table 3) found no such debris when they performed physical analysis of certain of

the middens from which Desert Side-notched points have been recovered, such as the Johnson Mound (Sac-6). Obsidian chippage was found to be present in small but perceptible quantities while chert chippage was completely absent. The obsidian in these sites, the common material for projectile points other than Desert Side-notched points, is derived from the Napa and Lake Counties obsidian quarries to the west.

What we have, then, is a definite indication that obsidian was traded in from the west with local manufacture of the products, while the chert points, already made, were traded in from the east. We do not yet know the source of the chert points to the east, but the distribution of the Delta subtype, Desert Side-notched point, indicates that it may have been at about the latitude of Lake Tahoe (Map 2).

Shasta County

The Desert Side-notched points from Shasta County come from one of two areas: the Shasta Dam-Redding area (sites Sha-19, 20, 21, 44, 46) and the Fall River-Hat Creek area (sites Sha-52, 140).

The one large excavated site in the Shasta Dam area is Sha-20 (Smith and Weymouth, 1952). The provenience of the Desert Side-notched points from that site is presented herewith.

Table 11

Desert Side-notched Points from Sha-20

Surface	General Subtype			Redding Subtype		
	8			3		
	Tr. I	Tr. II	Other	Tr. I	Tr. II	Other
0-12 in.	1	2	1	1	5	-
12-24 in.	1	1	-	-	-	-
24-36 in.	-	-	-	-	-	-
36-48 in.	1	-	-	3	-	-
48-60 in.	2	-	-	5	-	-
60-72 in.	1	1	-	2	-	-
72-84 in.	-	-	-	-	-	-
84-96 in.	-	-	-	1	-	-

Burial 5 (late, with pinenut beads): one General subtype.
Burial 6 (Historic): one General, two Redding subtypes.
One Redding subtype specimen is without location data.

It will be observed that, with one exception, all occurrences deeper than 24 inches, of both Redding and General subtypes, are in Trench I. It was in this trench that all but one of the burials occurred, including some very deep historic burials (Bur. 6, for example, at 61 in.). The graves in the historic period were evidently dug from near the 1940 surface of the site. The deep occurrences of Desert Side-notched points in this trench are, therefore, either themselves attributable to historic burials or, at any rate, to the disturbance caused by the historic burials. This would also explain the scarcity of Desert Side-notched points in the 12-36 inch levels.

If we have a case of reverse stratigraphy in Trench I, it is evident that the Redding subtype is more common in later times than the General subtype, for it is the Redding subtype that is deepest in Trench I and shallowest elsewhere.

The other site of significance in Shasta County is the Callison Site (Sha-52) on Fall River. We find none of the Redding subtype here, indicating that this subtype did not reach so far east, at least in numerical strength. The stratigraphic details of the Callison Site are given below:

Table 12

Desert Side-notched Points at Sha-52

Level (in.)	Subtype	
	General	Sierra
0-6	1	1
6-12	1	-
12-18	2	-
18-24	1	-

Burial 2 (had no other associations): one Sierra subtype.
Burial 7 (a very late burial with preserved textiles): one General, 5 Sierra subtypes.

The evidence here suggests that the Sierra subtype came into the area not more than one to two hundred years ago, and that the General subtype preceded it by two hundred years or more.

Siskiyou County

Siskiyou County collections of Desert Side-notched points are derived from two separate localities. One group of sites, including Sis-7, 10, 11, 30, 41, 49, 108, 206, 247, is in the northeast corner of the county, in the Klamath Lake region. Other sites (Sis-163, 262, 263, 264) are in the western part of the county in Scott Valley and on the Klamath River. Sites Sis-7, 10 and 11 were investigated by J. D. Howard and may include several occupation areas. The catalog entries for these sites read as follows:

Sis-7: "Probably Canby's Cross, Canby Bay, south end of Tule Lake, Siskiyou County."

Sis-10: "Oklahoma Landing and Fleming Island, Lower Klamath Lake, Siskiyou County."

Sis-11: "Probably Siskiyou County, Lower Klamath Lake, NW 1/4, sec. 19, T48N, R3E, MDBM."

Other specimens from the Tule Lake region were collected by R. J. Squier and Gordon Grosscup. Squier (personal communication) informs us that Desert Side-notched points are associated definitely only with the latest or Tule Lake Phase (post 1500 A.D.) in the region. It will be recalled that this same association apparently also holds for sites in Modoc County.

For the sites in western Siskiyou County, we have no information as to period except that Sis-262 is known to be historic.

Solano County

Only one Desert Side-notched point from a single site is recorded from Solano County. The site is Peterson 2 (Sol-2), which has components of Phases I and II of the Late Horizon and also a Middle Horizon component. The Desert Side-notched specimen is to be attributed to the Late Horizon, Phase II component.

Sutter County

The single site from Sutter County producing Desert Side-notched specimens is the Vernon Site (Sut-11). This site has yielded materials from both Phase I and Phase II of the Late Horizon.

Tehama County

Desert Side-notched points from Tehama County come from two separate regions: the Red Bluff area (Teh-58) and the foothill region east of Red Bluff (Teh-1, 193, 194). The Redbank Site (Teh-58), near Red Bluff, may be characterized as the center of a highly developed protohistoric culture without notable dependence on the lower Sacramento Valley, and, in fact, with more pronounced affinities toward the west (Treganza, 1954). It is at this site that we find the most marked development of the Redding subtype of the Desert Side-notched point. It is probably in this region that this subtype originated. The site seems to be entirely protohistoric and historic and presents little chance of obtaining stratigraphic evidence regarding historical priority of the subtypes.

In the region to the east of Red Bluff, Desert Side-notched points have been recovered from two excavated sites: Kingsley Cave (Teh-1) and Payne Cave (Teh-193). Since Kingsley Cave is for the most part older than Payne Cave (Baumhoff, 1955, 1957), the prevalence of the Redding subtype at Payne Cave and paucity of this subtype at Kingsley Cave must indicate that the Redding subtype is later in the region.

This contention is borne out by the association of these projectile points at Kingsley Cave. The single point of the Redding subtype was associated with Burial 5 which also had ninety-nine clam shell disc beads associated with it, indicating that it was from the protohistoric or historic period. Points of the General subtype came from all levels of the site (0-55 in.) and therefore may date from as much as three hundred years ago. The single point of Sierra subtype occurred at a depth of 21 inches, and may therefore be of an intermediate age.

Tulare County

The single Tulare County site which has produced Desert Side-notched points also produces potsherds; hence it may be considered to date from a very recent period.

Tuolumne County

See Mariposa County.

Temporal and Geographical Relationships

The areal distribution of the Desert Side-notched points is shown on Maps 2 and 3. Some special comment is required for greater clarity. It will be observed that the Desert Side-notched points did not diffuse to the Pacific Coast north of San Diego County (it is also only in San Diego County and south that pottery manufacturing reached the Pacific). North of here occasional specimens are found on the coast (note Marin County specimen mentioned above), especially in historic times, when there was probably some mixture of inland and coastal peoples (Pilling, 1955, p. 80, discusses such points occurring at historic sites). The distribution shown on Maps 2 and 3 illustrates aboriginal conditions of about 1750 and ignores some isolated occurrences outside the main area of distribution.

The distribution in California south of the Tehachapis is not derived from observations on individual site collections, of which there are very few in the U. C. Museum of Anthropology, but is taken from a study by Eberhart (n.d.) from published sources. Eberhart is intimately acquainted with Southern California archaeology and his view on this matter can be relied upon.

For the distribution of the subtypes, we may indicate the main points of uncertainty. For the General subtype we have shown a gap in the distribution within the Central Valley from Sutter County to about the southern boundary of Tehama County. The existence of such a gap rests on weak ground, since only the smallest collections are available from the area. There are two reasons for assuming that there actually is such a gap: (1) the Howells Point Site (Col-2) revealed only one Desert Side-notched point even though it was a full Phase II site with many projectile points of other types, and (2) the Redding subtype with its northern distribution indicates a separate development in relative isolation from the Delta area.

Elsewhere the distributions of the General subtype seem relatively firm. We may add that although the subtype is present in the southern San Joaquin Valley, it is definitely of minor importance.

For the Sierra and Redding subtypes the distribution seems to be on firm ground, except that the southern limit of the Redding subtype is uncertain. Elsewhere, there is an adequate sample of sites along the limits of the distribution.

The distribution of the Delta subtype presents a more complex problem. The southern limits of the subtype are not well established because of the

lack of adequate collecting in the San Joaquin Valley. The extension of this subtype into the Sierra seems well established and, in fact, there are occurrences of this subtype as far east as Stillwater in the Carson Sink of Nevada. It has been suggested earlier (cf. discussion under Sacramento and San Joaquin Counties) that the presence of the Desert Side-notched points in the Delta are to be accounted for, at least in part, by trade from the east. As yet the source of the points has not been discovered. Presumably, it is not in central or northern Nevada or the Delta subtype would be more common than it is in the Carson and Washoe Valleys. Evidently, then, it is in the foothill or Sierra region in California. One may suggest Placer or Nevada Counties as being the most likely source.

The following table gives our best estimate of the dates of introduction of the subtypes.

Table 13

Suggested Dates of Introduction of Desert Side-notched Points to Various Localities in California

	Subtypes			
	General	Sierra	Delta	Redding
Delta Region	1450	-	1500	-
N. Sacramento Valley	1600	-	-	1700
S. San Joaquin Valley	1650	-	-	-
S. Sierra	1350	1450	-	-
Central Sierra	1350	1450	-	-
N. Sierra	1400	1500	1500	-
N.E. California	1500	1600	-	-
Owens Valley	1300	1400	-	-

The dates given depend heavily on interpretations of the Central California cultural sequence. It is the present opinion of J. A. Bennyhoff (personal communication), based on intimate knowledge of the Late Horizon and on several radiocarbon dates, that the beginning of Phase II of the Late Horizon in Central California is to be dated at 1500 A.D. Since our evidence indicates the presence of Desert Side-notched points in terminal Phase I times, we have subtracted 50 years from the beginning Phase II date, thus estimating 1450 A.D. as the likely date for the introduction of the speci-

mens (General subtype) into the Delta region. If subsequent investigations indicate that the beginning Phase II is incorrect, the dates for Desert Side-notched points should be shifted accordingly.

The dates given for the Sierra and for Owens Valley depend upon the Central Valley dates. Since the Desert Side-notched point is earlier in the Southwest region than in California, the diffusion of the type must have been from east to west and from south to north. This being so, we presume that the dates for its introduction into the southern and central Sierra Nevada are earlier than the dates for the Central Valley and still earlier for the Owens Valley region.

The dates given for the northern part of the state are, to some extent, independent of the Central Valley sequence. In the northern Sacramento Valley these projectile points occur in contexts that give every appearance of being barely prehistoric. We are supported in this by R. J. Squier's guess date for his Tule Lake Phase in Modoc and Siskiyou Counties at 1500 A.D., since this is the only culture producing Desert Side-notched points in the region. We may point out a large discrepancy between the present dating and that of L. S. Cressman in southern Oregon. Cressman (op. cit., chart 3, fig. 45) found Desert Side-notched points in Level I of his Kawumkan Springs Midden. He indicates that Level I represents an occupation between 250 B.C. and 150 A.D. Since the Kawumkan Springs Midden is only a few miles into Oregon from California, it is clear that his and our datings for the Desert Side-notched points should mesh, rather than show a difference of more than 1500 years. Again, additional investigation is needed to clarify the issue. We will not attempt here to reconcile the discrepancy.

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Explanation of Figure
[Following page 40]

Figure 1: Frequency Distribution of Weights and Lengths of Desert Side-Notched Projectile Points.

Explanation of Maps
[Following page 40]

Map 1: California Archaeological Sites Producing Desert Side-Notched Points.

Map 2: Distribution of Desert Side-Notched Points, General and Delta Subtypes.

Map 3: Distribution of Desert Side-Notched Points, Sierra and Redding Subtypes.

Explanation of Plate 1*

(All specimens stored in University of California Museum of Anthropology [UCMA]. Numbers with "1-" prefix are Museum numbers proper; "L-" prefix, Lillard Collection; "B-" prefix, Barr Collection.)

a-f: General subtype
- a. 1-40365, Lower Klamath Lake, Siskiyou County.
- b. B-409 (provenience unknown).
- c. 1-57913, site Sac-6 (Johnson Mound, Sacramento County).
- d. 1-63034, site Sha-20 (McCloud River, Shasta County).
- e. B-807 (provenience unknown).
- f. L-16232 (provenience unknown).

g-k: Sierra subtype
- g. 1-40731, Siskiyou County.
- h. 1-134698, site Mrp-105 (Mariposa County).
- i. 1-40368, site Sis-11 (Lower Klamath Lake, Siskiyou County).
- j. 1-40371, site Sis-11 (Lower Klamath Lake, Siskiyou County).
- k. 1-40297, site Sis-11 (Lower Klamath Lake, Siskiyou County).

m-r: Delta subtype
- m. L-7915 (provenience unknown).
- n. L-1514, Lincoln Mound, Placer County.
- o. L-1515, Lincoln Mound, Placer County.
- p. L-1529, Lincoln Mound, Placer County.
- q. L-1516, Lincoln Mound, Placer County.
- r. 1-57847, site Sac-6 (Johnson Mound, Sacramento County).

s-x: Redding subtype
- s. 1-133254, site Teh-1 (Kingsley Cave, Tehama County).
- t. 1-152107, site Teh-58 (Redbank Site, Tehama County).
- u. 1-151843, site Teh-58 (Redbank Site, Tehama County).
- v. 1-151847, site Teh-58 (Redbank Site, Tehama County).
- w. 1-65134, Humboldt Lakebed, Churchill County, Nevada.
- x. 1-151795, site Teh-58 (Redbank Site, Tehama County).

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*Plate 1 follows p. 40.

73. Petroglyphs of Sacramento and Adjoining Counties California

L. Arthur Payen

Introduction

The lower foothills of the Sierra Nevada, approximately eighteen miles east of Sacramento, show evidence of having been heavily populated in prehistoric times. In this area there are numerous aboriginal occupation and bedrock mortar sites. The hill region, extending from the edge of the Sacramento Valley to an elevation of about 1,000 feet, was in many ways ideal for habitation. There was an abundance of oak trees which furnished a large supply of acorns for food. A variety of large and small mammals provided a ready source of meat for the people in this region. The climate of the foothill area is milder than that of the Great Valley; the winds are not so strong and there are fewer and less severe seasonal frosts there than on the valley floor. Furthermore, the foothill area generally is above the fog line and below the snow line. The hills offered a supply of raw materials for the manufacture of domestic implements, which were in demand by people in the valley to the west.

Little archaeological study has been carried on in this area and what has been done so far lists nothing of petroglyph occurrence along the valley's edge. The classic work of Steward (1929) states, "In California the Sierra Nevada mountain range has been an effective barrier to the western spread of petroglyphs. The great central valleys are totally devoid of any examples of petrography." One can understand why such a conclusion was arrived at; besides the fact that little work has been done in this area, heavy growths of lichen and moss make it difficult to recognize many petroglyph sites. The sites, for the most part, are not prominent as are those in drier climates where few if any lichens cover the rocks.

It has been found that the only feasible way to locate sites is to set up a systematic way of surveying an area where many rock exposures are present. It is necessary to find ways to get a complete idea or picture of the designs at a site after it is located. The following points were found useful in locating and recording petroglyph sites in an area where rocks are thickly covered with lichen and moss: 1) An area should not be surveyed on an overcast day; surveying should be done in brilliant sunlight only. With poor light, it is often very difficult to see faint markings. 2) Once a site is located it should be revisited at night with a gasoline

lantern. When the lantern is held off to one side and parallel to the rock face, the light will throw shadows in grooves or depressions on the surface of the rock. This makes the designs show up very plainly and, in fact, some designs can be seen at night that are not visible in daylight. The lantern should be moved from one side of the rock to the other to cast the light in at various angles so that no lines or designs are overlooked. It is advisable to check all rocks in and near the site with the night-lighting method. 3) If lichen or moss growth is very thick, it is often helpful to remove it with some bleaching chemical such as Clorox. Care should be taken to examine the rock face first to see if any pigment is present, as the chemical may remove it. 4) All rock exposures noted should be examined carefully. It has been observed in this region that no special or "reasonable" placement of a petroglyph site was made by the Indians. Petroglyphs were found on hilltops, along stream beds, and in occupation sites. Size, shape, surface smoothness, or plane of surface seems to have no bearing on whether a rock will have petroglyphs: all rocks must be examined carefully. In several places, recorded markings were found to be placed on comparatively poor rocks, while excellent rock surfaces only a few hundred feet away evidently were neglected.

I would like to thank Mr. F. A. Riddell and Mr. N. L. Wilson of the State Indian Museum, Sacramento, California, and Mr. J. A. Bennyhoff, who was associated with the University of California Archaeological Survey during the writing of this paper, for their invaluable help and encouragement in this project. Thanks also is due to the ranchers, too numerous to mention here, who were generous in allowing me to survey and record sites on their property.

Description of Sites

Placer County

*Pla-2, Rocklin. Petroglyphs are located on the east sides of two granite boulders, one mile south of Rocklin in southern Placer County (Map 1). This site is associated with a sizable midden deposit on the edge of a small stream which flows into Secret Ravine. Other boulders at the site contain a number of bedrock mortars. One such boulder has step-like depressions on the side which appear to have been made as an aid in getting to the top of the rock, where several mortar holes are located.

Local inhabitants have dug into burials around the east bases of the petroglyph rocks and have recovered numerous glass trade beads. Mr. Val Jacobson,

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*Site designations, appearing as county abbreviations plus numbers, are those of the University of California Archaeological Survey.

the owner of the site, provided a sample of the beads. The trade bead types from this site are listed in the Hood Bead Classification housed at the State Indian Museum in Sacramento. They are as follows: small white beads, types F52 and F53; red beads, type A2; small blue glass beads, type D10; green glass faceted, type C38.

The petroglyphs have been subjected to vandalism and some designs may have been altered. The design elements consist largely of cup-shaped depressions ranging in size from 1 to 3 inches in diameter and from 1/8 to 1 inch in depth. These depressions are numerous and, for the most part, are scattered at random with no apparent plan in grouping or placement. Thirteen of these dots or depressions are arranged in a straight line and seem to represent the only attempt at an organized design. Next to the dot series (see Fig. 1b) is a zigzag groove element which is terminated at one end with a dot, thus possibly indicating a snake element. Less numerous than the dots are oblong depressions and short grooves. Some appear to have been made by connecting two dots.

Pla-37, Rocky Ridge. This site is two miles east of Roseville, on the north side of Miners Creek. The petroglyphs consist mainly of deeply grooved elements on the south, vertical, faces of ten large sandstone boulders which make up part of a rock outcrop. The outcrop is the first large group of foothill rocks to be found along the eastern edge of this part of the valley. Many bedrock mortars are found in the outcrop, but none in the boulders with petroglyphs on them. Associated with the petroglyph group are bedrock mortars numbering in the hundreds and a small occupation area. Just to the south of the site and on opposite sides of Miners Creek is an occupation site (Pla-38) which shows signs of having been disturbed by vandals. Artifacts from the surface of these sites appear to be of late origin, but no historic material was noted.

The design elements of Pla-37 petroglyphs are wavy lines, small nucleated circles, floral type designs, dots, simple circles, and figure eights (Fig. 2a-f). To the east of the main group of petroglyphs is a boulder which has a number of short, V-shaped grooves. These are about 4 to 6 inches in length and 3/4 inch in depth. Also, there are some straight grooves, ranging in length from 10 to 30 inches. The grooves appear to have been both pecked and rubbed in. The units are fairly large, with an average of about 14 inches in diameter. The depth of the incisions is from 1/16 inch to 1 3/4 inches, with an average of about 1 inch. The width ranges from 3/4 inch to 3 inches, and the average is 1/2 inch. It was noted that on several faces the petroglyphs extend below the soil surface and whole designs were found as much as 11 inches below the recent soil level. One sandstone boulder is split in two pieces and separated 10 inches (Fig. 2c). This must have happened after the petroglyphs were put on, as the design continues from one part to the other.

Even these large, deeply cut designs are hard to distinguish unless seen in bright daylight or with the night-lighting method. A shaped mortar, with incised zigzag lines around it, was found about 100 yards west of the petroglyphs. The mortar stands 10 inches high and is 9 inches in diameter. The style of the design is the same as that found on the rocks nearby (Fig. 8c-f).

Eldorado County

Eld-69, Carson Creek 1. This site is one of three found along Carson Creek, a tributary of Deer Creek, which flows from western Eldorado County into Sacramento County. The petroglyphs are found on an outcrop of hard metamorphic rocks about one-half mile east of the Carson Creek bridge on Payen Road near a large spring. There seems to be no sign of an occupation site in connection with the petroglyphs.

The petroglyphs are on the south sides of the vertical faces of some twelve rocks in the outcrop. The design elements consist of dots, wavy lines, circles, grid, bars, and a rake. Dots or pits are on most of the rocks. They range in size from 1/8 inch to 2 inches in diameter, and from 1/16 to 1/2 inch in depth. Wavy line designs are prominent, one being terminated with a dot at both ends (Fig. 3a). Circles occur on several faces; a rectangular grid is found on a horizontal face of one small boulder (Fig. 3g); lines or bars are found in series; and a rake design also occurs (Fig. 3i). The designs appear to have been made by pecking, in one instance to a depth of 3/4 inch. The depths of the grooves average 1/16 inch. Some surfaces show evidence of having been pecked as though in an attempt to smooth them down. Designs appear on both the horizontal and the vertical faces of the boulders at this site.

A careful search was made for artifacts in the vicinity of the site. Several crude quartz specimens, possibly fragments of some unidentifiable tool, and one fragment of a projectile point were found near the outcrop. A broken hammerstone of the same material as the local rock outcropping was found 150 feet west of the petroglyphs. The stone has a small groove around its short diameter, and its striking surface shows repeated battering. It is possible that the hammerstone may have been used in the making of petroglyphs and was discarded when it was broken.

Sacramento County

Sac-229, Carson Creek 2. Several of the most outstanding petroglyphs in the group discussed in this paper occur at this site, which is three and one-half miles downstream from Eld-69 on Carson Creek. When the south

bank of Sac-229 was first discovered a large target design was noted (Fig. 4a). Later, excavation exposed another outstanding petroglyph next to it. The second rock was covered by occupation site soil consisting of a mixture of red earth with a few cooking rocks and a little charcoal. The total depth of the deposit is about two and one-half feet.

The target type design on the rock first noted is rubbed in relief, and the buried rock has a chain design which also is rubbed in. Partly superimposed on this chain design is a large incised bisected concentric circle element 17 inches in diameter (Fig. 4b). These concentric circles are pecked and the element as a whole is lighter in color than the rubbed chain element, which shows considerable discoloration, as though it were much older. Both designs were cut through the reddish-colored exposed layer of the rock to a light gray under-surface, making a two-tone effect. Not until other rocks in the immediate vicinity were checked for markings with the night-light method was it discovered that all the rocks near the first find had markings on them. The designs were so faint that it was impossible to see them in the daytime. Some rocks have been broken since the design was placed on them (Fig. 4f). Design elements on these faintly marked rocks are concentric circles, wavy or tadpole-like figures, and circles enclosing crossed lines (see Fig. 4d). Sizes of the designs vary from 6 to 20 inches in diameter.

On the opposite side of the creek numbers of manos, metates, pestles, mortars, and several small "paint" mortars were found. One is a small slab of sandstone with three holes 1 1/2 inches in diameter and 3/4 inch in depth. These artifacts were uncovered years ago by gold mining along the edge of the creek.

Sac-213, Carson Creek 3. This site is located downstream from Sac-229. The petroglyphs here (Fig. 5) are on four rocks in a massive jumble of large boulders along the north bank of Carson Creek. The site is not extensive, and there are only ten glyphs present. Three of these are concentric circles and two are simple circles. In addition, one target design, one small tadpole-like figure, one large ovoid figure with cross-hatching, and a few scattered lines may be discerned. The cross-hatched figure measures 21 by 27 inches, while the concentric circles measure from 8 to 16 inches in diameter. The petroglyphs are pecked to a depth of 1/4 to 1/16 of an inch. They are on the south face of the rock mass. As at Sac-229, it appears that vandals have been using the circles as rifle targets. Several bedrock mortars were found along the edge of the creek but no other artifacts were noted at the site.

Sac-216, Little Deer Creek. Between Carson Creek and Deer Creek in

eastern Sacramento County is a small stream called Little Deer Creek, a tributary of Deer Creek. Near the junction of a smaller, unnamed stream and Little Deer Creek are a number of petroglyphs on a vertical slate outcrop. Eleven rock faces, ten facing east and one facing west, have markings on them.

The petroglyphs are similar to those at Pla-2 in that they are composed of two distinct designs. One is of dots or pits which are conical in shape and range in size from 1/4 to 3 inches in diameter, and 1/8 to 3/4 inch in depth. Some dots are in series, but for the most part they occur at random or in clusters. The other type of marking common to Pla-2 and Sac-216 is a short groove in two forms: (a) those connecting two dots or pits at each end (Fig. 6a), and (b) straight V-shaped grooves from 3 to 6 inches long, 1 to 2 inches wide, and 3/4 to 2 inches deep. The scaly nature of the rock may explain why there are no complex designs present at the site. It was observed that one rock had fallen from its original position, thereby leaving the petroglyphs on its under side. When the markings were compared with others nearby, they showed much less weathering, thus indicating that the stone had fallen sufficiently long ago to emphasize the difference between ground weathering and that type due to open-air exposure.

The site is associated with five bedrock mortars which are found in the stream-bed nearby. Downstream from the petroglyph area is a small occupation site at the base of a cliff on the stream's edge. The only artifacts found here were several pestles.

About 400 feet to the south of the petroglyphs are two alignments or piles of rock which appear to be man-made. The larger of these is composed of a number of large stones in a circle 10 feet in diameter, with smaller stones in the center. Some of the stones in the ring must have required considerable effort to move into place. No artifacts were found at this site.

Sac-228, Deer Creek 1. This is the most extensive and outstanding site in the series. It is located on a high hill about one-half mile south of Deer Creek and one mile south of Sac-227 (see below). The hill rises some 200 feet from the surrounding country and is 590 feet above sea-level. It offers an excellent view of the valley and the area around it on all sides. Petroglyphs are found in two spots on the hilltop, the first being 400 feet north of the main group. This group is made up mostly of dots scattered over four rocks. On one smooth stone there are concentric circles and several simple circles. These designs cannot be seen with natural lighting and are faint even when examined with the use of artificial lighting at night.

Petroglyphs of the main group are found on the eastern faces of two rows of outcropping rock. There are more elements present at this site than at any of the other sites mentioned in this paper. The petroglyphs are quite large. One face, measuring 5 by 9 feet, has several complex floral designs 3 feet high (Fig. 7d). The concentric circles that make up part of the design are about 20 inches in diameter. Other designs are wavy lines, zigzag dots in series, random dots, circles, bisected circles, target designs, grid, spiral, figure eight, and a spider web design 21 inches in diameter. There are also many miscellaneous lines which may or may not be connected with the recognizable design elements. Design elements found at many of the other sites in the series are present at Sac-228, along with several elements not found at the other sites and which occur only once at this site.

Techniques used in producing the petroglyphs were pecking and rubbing. Most designs are pecked and only a few of the rubbed type are present. One of the latter appears to be superimposed on the pecked design. The depth of the lines varies from less than 1/16 to 1/4 inch, and the width averages about 1/2 inch.

Excavation around the bases of the rocks has produced several hundred basalt chips, some larger basalt blanks, broken quartz crystals, a leaf-shaped basalt point 6 cm. in length, several stream-worn rocks possibly used as hammerstones, and a fragment of red hematite. It is unlikely that the site was a permanent camp as there is no close water supply. It was more likely a ceremonial place or workshop.

Sac-227, Deer Creek 2. Petroglyphs were found on a flat boulder on a slope two-fifths of a mile north of Deer Creek and about one hundred yards from Payen Road on the Russel Ranch in eastern Sacramento County. The decorated rock is part of an outcrop of hard metamorphic rock. There are many exposures of this type of rock in the area, some of which have smoother faces than the one which is decorated.

When this site was first located, the carved face of the boulder was covered with smaller rocks as if an attempt had been made to hide the markings. The petroglyphs are very faint and only a few designs are visible by daylight. With the use of the night-light method, however, the whole surface shows many lines and dots. A spoked wheel design 16 inches in diameter is the most prominent symbol at the site. Other designs on the boulder are sun disks, one with a dot in the center, another with a cross (Fig. 8a); a bisected concentric circle; a bisected simple circle; dots; dots in series; and figure eights. Most of the elements are joined by lines to make up a large complex design. The petroglyphs are pecked to

an average depth of 1/16 of an inch. The lines are from 1/4 to 1/2 inch wide.

Sac-234, Deer Creek 3. About one-half mile to the southeast of Sac-227, on the south bank of Deer Creek, are a number of stone walls, including what evidently was a foundation wall of an old ranch house. A slab in one of the walls had petroglyphs on it. An attempt was made to find the spot where the rock was originally located. It was found that the stone was quarried along the creek where it enters a canyon nearby. Here the rock has a red stained surface with a light gray interior. The stone from the wall matches. In all probability there was a petroglyph site along the creek at this point. The nature of the wall stone is unlike that of any of the other petroglyph sites in the area, hence the possibility of its coming from one of the latter is unlikely.

The slab measures 7 by 28 inches and has a light red surface. The petroglyph is pecked through the red surface into the gray, underlying stone, giving a two-tone effect, as at Sac-229. The single design unit has an element similar to one found at Sac-229, i.e., a circle with lines cutting the enclosed part (cf. Figs. 4d, 8b). Around this element is a line which in turn joins a straight line running the length of the remaining part of the rock's surface. There are several groups of small dots present on the rock. The whole surface shows pecking as if an attempt had been made to smooth it.

Sac-231. "Baby-rock" (see p. 80) type petroglyphs occur in association with bedrock mortars in an outcrop of fossiliferous limestone on Carson Creek one-half mile west of the bridge on Scott Road. The site is located on the crest of a cliff on the south bank of the creek. The petroglyphs are in the form of a series of fourteen small pits or dots which range in size from 1 to 2 1/2 inches in diameter. Eight pits occur in one series.

There are also twenty bedrock mortar holes in this rock outcrop. The outcrop itself is located on a habitation site as evidenced by the midden deposit. Other occupation sites have been recorded in the vicinity of this site.

Distribution and Description of Design Types

Design elements are described in terms of type, size, and occurrence (summarized in Table 1 below).* The names given to the elements are des-

* In Table 1, data from Sac-234 is not included. The original location of the petroglyph boulder found at what is referred to as site Sac-234 is not known.

Design element	Random dots	Clustered dots	Series dots	Simple circle	Nucleated circles	Concentric circles	Nucleated concentric circle (target)	Bisected circle	Spoked wheel	Spider web	Sun disk	Cross hatch	Rake	Figure eight	Chain	Spirals	Wavy lines and tadpole	Floral designs
Site																		
Pla-2	40	10	4	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Pla-37	10	-	-	3	5	-	-	-	-	-	1	-	-	1	-	-	12	2
Eld-69	30	5	-	9	1	-	-	-	-	-	-	1	1	1	-	-	4	1
Sac-213	-	-	-	2	-	3	1	-	-	-	1	1	-	-	-	-	1	-
Sac-216	50	10	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sac-227	10	6	6	3	-	1	-	2	1	-	2	-	1	3	-	-	-	-
Sac-228	20	6	3	13	1	9	6	2	-	1	2	1	1	1	-	1	6	4
Sac-229	1	-	-	1	-	10	1	1	2	-	-	-	-	-	1	-	2	-
Sac-231	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	164	37	21	31	7	23	8	5	3	1	6	3	3	6	1	1	26	7

Table 1. Distribution of Petroglyph Elements at Various Sites in the Sacramento Valley-Sierran Foothill Region.

criptive only and are not in any way intended to explain a possible meaning. Most design types discussed here are described in previous works on petrography (Steward, 1929; Cressman, 1937, p. 10).

Random dots. Dots or pits may be cup-shaped or conical depressions ranging in size from 1/8 to 3 inches in diameter and 1/16 to 1 inch in depth. Dots are placed without apparent attempt to make an organized design. Dots are found in varying numbers at all sites, with the exception of Sac-216. Pla-2 and Sac-231 are represented almost entirely by these dots. Dots seem to be the most common design in this series, and may vary from a dozen to several hundred at a site.

Clustered dots. Dots or pits formed in the same manner as above are usually found in groups of three. Clustered dots occur at Pla-2, Eld-69, Sac-216, 227, 228 and 231.

Series dots. Definite specialization of dots or pits occur at Pla-2, Sac-227, 228, and 231 as series in a straight line. At Sac-228 a group of dots forms a rectangular pattern, with three dots on each of the short sides and nine dots on each of the long sides.

Simple circles. Circles appear as a fairly common design at Pla-37, Eld-69, Sac-213, 227, and 228. These range in size from 3 to 20 inches in diameter.

Nucleated circles. Circles with a central dot are present at Pla-37, Eld-69, and Sac-228. The design occurs only once at Eld-69 and Sac-228. At Pla-37 the circles are found in connection with several complex designs and also separately. Nucleated circles are generally small, averaging about 4 inches in diameter at all three sites.

Concentric circles. These designs are formed by two or more circles with the same center. The number of circles may vary from two to six; total outside diameter ranges from 6 to 20 inches. The average symbol is about 10 inches in diameter and consists of three circles. Such designs occur at Sac-213, 227, 228, and 229.

Nucleated concentric circles or target design. These are the same as the concentric circles but with a central dot. This design type occurs more frequently than the concentric circles, and is often quite large, consisting of as many as seven circles. It is present at Sac-213, 227, 228, and 229. Sizes vary from 6 to 21 inches in diameter and may be associated with another, more complex, design; however, they are usually present as a single element.

Bisected circles. These are a circle or circles cut in half by a straight line. The best example of this symbol occurs at Sac-229 where a large concentric circle, 17 inches in diameter is bisected. A bisected concentric circle occurs at Eld-69, along with a small, single circle. Two small, simple circles are bisected by the same line at Sac-228.

Spoked wheel. This is a circle, with lines radiating from a central dot, which resembles the outline of a wheel. This type of design appears only once, at Sac-227.

Spider web. This design is similar in outline to a spider web, being a combination of concentric circles and the spoked wheel elements. It occurs only once, at Sac-228, and is 21 inches in diameter.

Sun disk. This is a circle with projecting lines or rays, which occurs only at Sac-227. Two designs are present: one has a central dot and the other a cross.

Oval with cross-hatch. At Sac-213 is a large oval measuring 21 by 27 inches. This is crossed with horizontal and vertical lines, making a cross-hatch. A similar design is found at Eld-69.

Rake. This design is composed of a main straight line with an evenly spaced series of short parallel lines extending at right angles from it. The element forms an outline similar to that of a garden rake. It occurs at Eld-69, Sac-227, and 228.

Figure eight. Two ovals join to form a symbol like a figure eight or a "moccasin track." These are present at Pla-37, Sac-227, and 228.

Chain. This design, which is a group of ovals connected in series to form a chain, is found only at Sac-229.

Spiral. This design occurs only at Sac-228. It is a simple open coil.

Wavy lines. These lines are often terminated with a dot or circle. They are found at Pla-37 as the main design element. The element is also prominent at Eld-69 and Sac-228. Several small wavy lines terminated by a dot or circle are present at Pla-2, Sac-213, and 229. The larger wavy lines may vary from 1 to 7 feet in length.

Floral designs. This is a complex design often resembling a flower or tree. At Pla-37 and Sac-228 the element looks like the representation of a tree (Figs. 2b, 7d). Other floral designs, some of them covering a rock area

of 2 or 3 square feet, resemble flowers with stems and leaves. In the latter, the flower part proper would be a large concentric circle 20 inches in diameter, the stem a line running down from the circle to the base of the rock face, and the leaves lines running laterally at a forty-five degree angle from the stem. On two design units (Figs. 2d, 7d) there is a line cutting across the stem. At Pla-37, for example, the design is formed by a line (stem) extending downward from a round depression in the rock, and cut by a wavy line through its lower portion.

Location of Sites

Petroglyphs were found associated with occupation areas at five of the ten sites discussed in this report. Of the ten sites, three are predominantly of the "baby-rock" class (Pla-2, Sac-216, 231) in that they display almost exclusively dots or pits (see Table 1). At all of the remaining sites except Sac-213, however, these dots or pits are present along with other elements.

Complex curvilinear petroglyphs occur in connection with sites Pla-37 and Sac-229. At both of these sites midden deposit has buried parts of the decorated areas of the boulders. At Pla-37 markings were found as much as a foot under the surface of the soil at the time of examination (see Fig. 2a, c, d). Six inches of deposit covered one outstanding petroglyph at Sac-229 (Fig. 4b). There is a possibility that more such marked rocks are buried at this site, as occupation deposit still covers parts of some large boulders.

Four curvilinear-type petroglyph sites were found in isolated places, not associated with occupation deposits. For example, Sac-227 and Eld-69 are located on high ground some distance from stream courses. Sac-213 is located in a boulder-strewn area along Carson Creek, but is nevertheless not near any occupation sites in the area. Sac-228 is located on the top of a steep hill where living conditions must have been unfavorable; on the other hand the hill offers a good view of the surrounding area, and the site may have been selected because of this factor. Larger and more suitable rock exposures with no evidence of modification on them are found at the base of this hill.

Summary

Petroglyphs are usually found on the east or south faces of rock outcrops (see Table 2, following). Such placement seems to have been a result of conscious selection, as west and north faces are rarely touched at any of the sites. At several sites designs are found on horizontal surfaces, but vertical faces seem to have been more popular when both were available.

Site	Rock Facing				
	North	South	East	West	Horizontal
Pla-2	-	-	2	-	-
Pla-37	-	10	-	-	-
Eld-69	-	10	-	-	1
Sac-213	-	4	-	-	-
Sac-216	-	-	7	1	-
Sac-227	-	-	-	-	2
Sac-228	-	-	15	1	1
Sac-229	-	-	5	-	6
Sac-231	-	-	-	-	1
Totals	0	24	29	2	11

Table 2. Facing Direction of Petroglyphs in Various Sacramento Valley-Sierran Foothill Sites.

Marking technique. Most of the petroglyphs appear to have been executed by pecking at the working surface with a small stone, although a few have obviously been rubbed rather than pecked. At several sites both techniques were used. At Sac-229 a pecked design is superimposed on a rubbed element. This single example suggests that the pecked type of petroglyph has a later origin than the rubbed type. It seems likely that certain elements were pecked out and then smoothed, as the rock at most of the sites is not of such nature as to make initial rubbing easy. At Pla-2, 37, and Sac-216 the petroglyphs were most likely made by both the rubbing and pecking techniques. Petroglyphs may be cut to depths ranging from less than 1/16 inch to 1 inch. The designs vary from several square inches to several square feet in area. The average size of an element is about 10 inches in diameter.

Use of pigment. During the excavation of the area around the bases of the decorated rocks at Sac-228, a small fragment of red hematite was found. The fragment has two ground faces, evidently the result of being rubbed on a rough surface. In all probability it was used in elaborating the carved designs by coloring. At Sac-229 several small portable mortars were found, and a small mortar pit is in the top of one of the decorated rocks. Lumps of hematite suitable for paint, but without ground faces, also have been found. The size of the mortars may indicate that they were used to grind pigment, as they are too small to be used for food preparation. One of these mortar slabs has three small holes in it, possibly intended to receive several colors. The holes are 1 1/2 inches in diameter and 1/2 inch in depth. If paint were used in this region for petroglyphs, an explanation may be had as to why many excellent faces at this and other sites seemingly were not used. They may have had pictographs on them which have since weathered away, while the pecked designs remained until recently discovered.

Tools. The presence of hammerstones and flaked tools at three sites may have some connection with the manufacture of the carvings. Hammers or stone mauls would have been useful, and it is likely that they were employed in some way in pecking out the petroglyphs in the comparatively hard stone which characterizes the area. Along with several hammerstones at Sac-228, flaked and core specimens, probably choppers, were found.

Age. With the information available at the present time, little can be said as to the age or the period at which these petroglyphs were made. Pla-2 markings are associated with what appears to be a late prehistoric-early historic period site, judging from artifact material found in the occupation deposit. Pla-37 was probably occupied in the late prehistoric period, while Sac-216 and 229, containing manos and metates in their occu-

pation deposits, may represent an older culture in the Sacramento Valley. Perhaps at some future date excavation of the sites may be of help in dating the stone carvings. The petroglyphs themselves show a great deal of discoloration and weathering. It is not positively known if this can be taken as an indication of great antiquity. Other possible evidence of reasonably great age may be seen at Pla-37, where a sizable stone, decorated with a group of wavy lines extending horizontally across the rock, has split into two sections. These have separated, presumably from natural causes, some 9 inches from each other (see Fig. 2c). Several examples of the same action, though not so spectacular, are found at Sac-229 (Fig. 4f).

Style area. The series of ten petroglyph sites discussed in this paper show two different stylistic types: (1) conical or cup-shaped pits and V-shaped grooves; and (2) those with curvilinear designs. The pit and groove type is usually seen as a random scatter over large rocks. Occasionally, pits are placed in series or in groups of three or more. This form of petroglyph is similar in form to the "baby-rocks" or "rain-rocks" of the northwestern section of California (Heizer, 1953). "Baby-rocks" were used by the Pomo for their supposed supernatural power that would give women the ability to bear children (Barrett, 1952). The so-called "rain-rocks" are described as having been used in rituals for controlling weather by the Hupa, Tolowa, Karok, and Shasta tribes (Heizer, op. cit.). Sacramento-San Joaquin Valley and foothill petroglyphs in the "baby" and "rain rock" category are found at and near Richardson Springs, Butte County (ibid.), and in Garner Cave on Rock Creek (But-71) (site records, U. C. Archaeological Survey, and in records of the State Indian Museum, Sacramento, California); in various locations in Sutter County; and in Stanislaus County, twenty miles east of Farmington (Heizer, op. cit.). This form of petroglyph has also been noticed in the Truckee Basin on the east slope of the Sierra. Some of these Truckee Basin sites are found, for example, in Martis and Sardine Valleys. Since this form of petroglyph is so widely distributed, it is not surprising to find it present in Sacramento County (Sac-216) and Placer County (Pla-2).

The second type of petroglyph design found in the Sacramento County area is composed predominantly of curvilinear elements, among which the circle is found most frequently, often elaborated into various complex line forms. Wavy lines were used freely at some sites and various linear designs, other than circle forms or wavy lines, are present, although not in such number as the latter elements. Dots or pits in series, differing from the characteristic "baby rock" forms in diameter and depth, are present. Human and animal forms are absent, with the exception of several serpent-like designs.

The curvilinear type petroglyphs show some relation to those designated curvilinear in the Great Basin (Baumhoff, Heizer and Elsasser, 1958). The most notable differences in petroglyphs of the Sacramento Valley-Sierran

foothill region and the Great Basin are: (1) the Great Basin area shows a great variety of elements which are not represented in the Valley-Sierran region, such as zigzags, diamond series, human forms, animal forms, and so-called rain symbols; (2) probably the combination pecking and rubbing is present with greater frequency in the Valley-Sierran area than in the Great Basin; (3) there is possibly a difference in average size of elements between the two areas, with Valley Sierran elements generally large (more than 20 inches in diameter). However, in the Great Basin there are sites which display many elements much larger than this; hence this comparison may not be entirely valid. The community bedrock mortar site near Volcano, Amador County (Ama-14), bears some interesting petroglyphs, in form like those in eastern Sacramento County. As one goes south, however, to the Stanislaus River Canyon near Columbia, petroglyphs are found showing closer relation to the Great Basin style area in size, manufacture, and type of designs. To the east, in the higher ranges of the Sierra Nevada, the typical Great Basin style is found represented at Donner Summit, at Meadow Lake, and at other sites in the area.

It is possible that the curvilinear petroglyphs in Sacramento County and surrounding area (Pla-37; Sac-227, 228, 229, 230; Eld-69; Ama-14) are of a separate California stylistic area, probably with relationship to the Great Basin petroglyphs. Further study and survey must be made before this can be positively determined.

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Explanation of Illustrations

Map 1: Petroglyphs in the Sacramento Valley--Sierra Nevada Foothill Region.

Figure 1: Petroglyphs at Pla-2.

Figure 2: Petroglyphs at Pla-37.

Figure 3: Petroglyphs at Eld-69

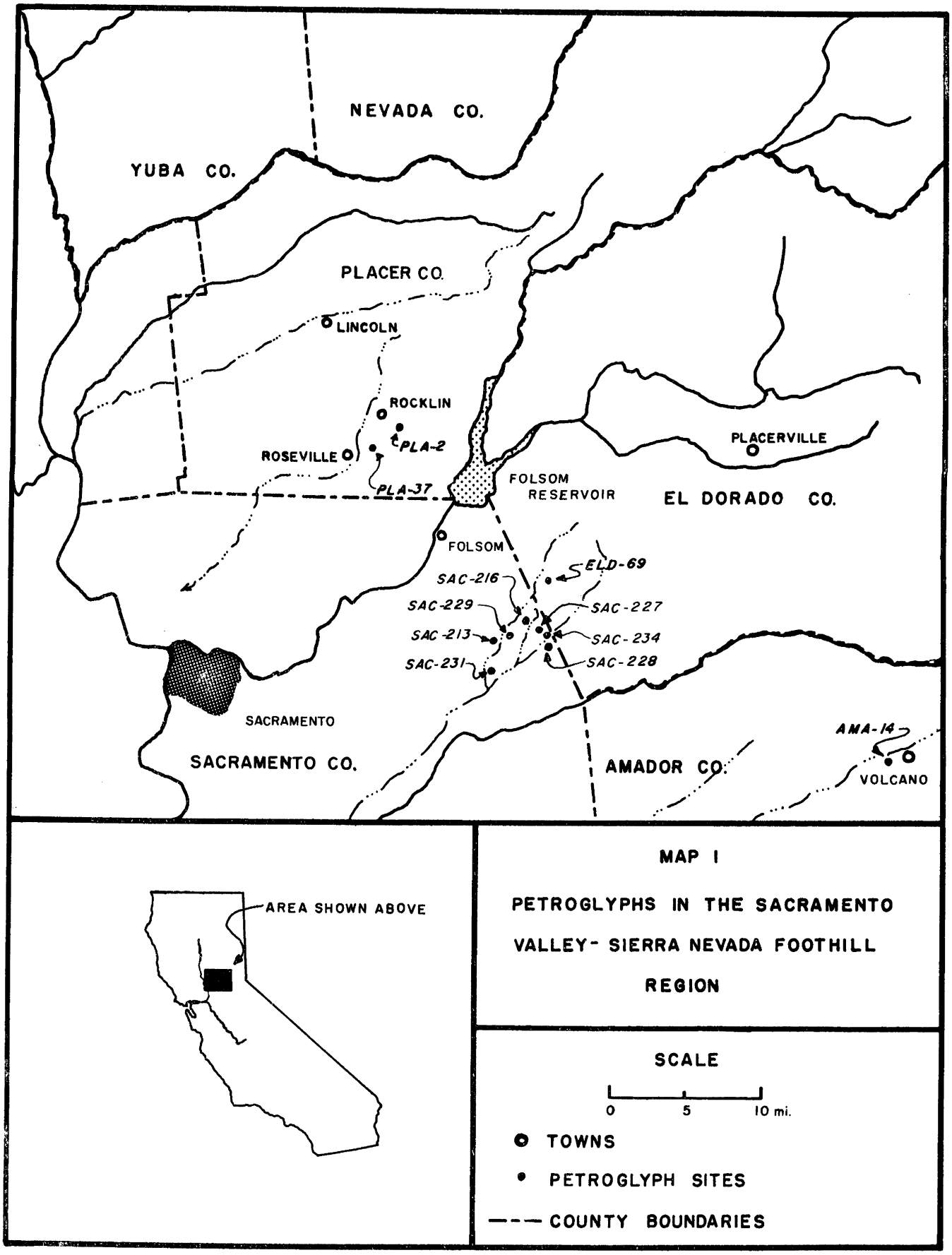
Figure 4: Petroglyphs at Sac-229.

Figure 5: Petroglyphs at Sac-213.

Figure 6: Petroglyphs at Sac-216.

Figure 7: Petroglyphs at Sac-228.

Figure 8: a. Petroglyphs at Sac-227.
b. Petroglyphs at Sac-234.
c-f. Views of decorated mortar from near Pla-37.


NEVADA CO.
YUBA CO.
PLACER CO.
LINCOLN
ROCKLIN
ROSEVILLE
PLA-2
PLA-37
PLACERVILLE
FOLSOM RESERVOIR
EL DORADO CO.
FOLSOM
ELD-69
SAC-216
SAC-229
SAC-227
SAC-213
SAC-234
SAC-231
SAC-228
SACRAMENTO
SACRAMENTO CO.
AMADOR CO.
AMA-14
VOLCANO
AREA SHOWN ABOVE
MAP 1
PETROGLYPHS IN THE SACRAMENTO VALLEY- SIERRA NEVADA FOOTHILL REGION
SCALE
0 5 10 mi.
TOWNS
PETROGLYPH SITES
COUNTY BOUNDARIES

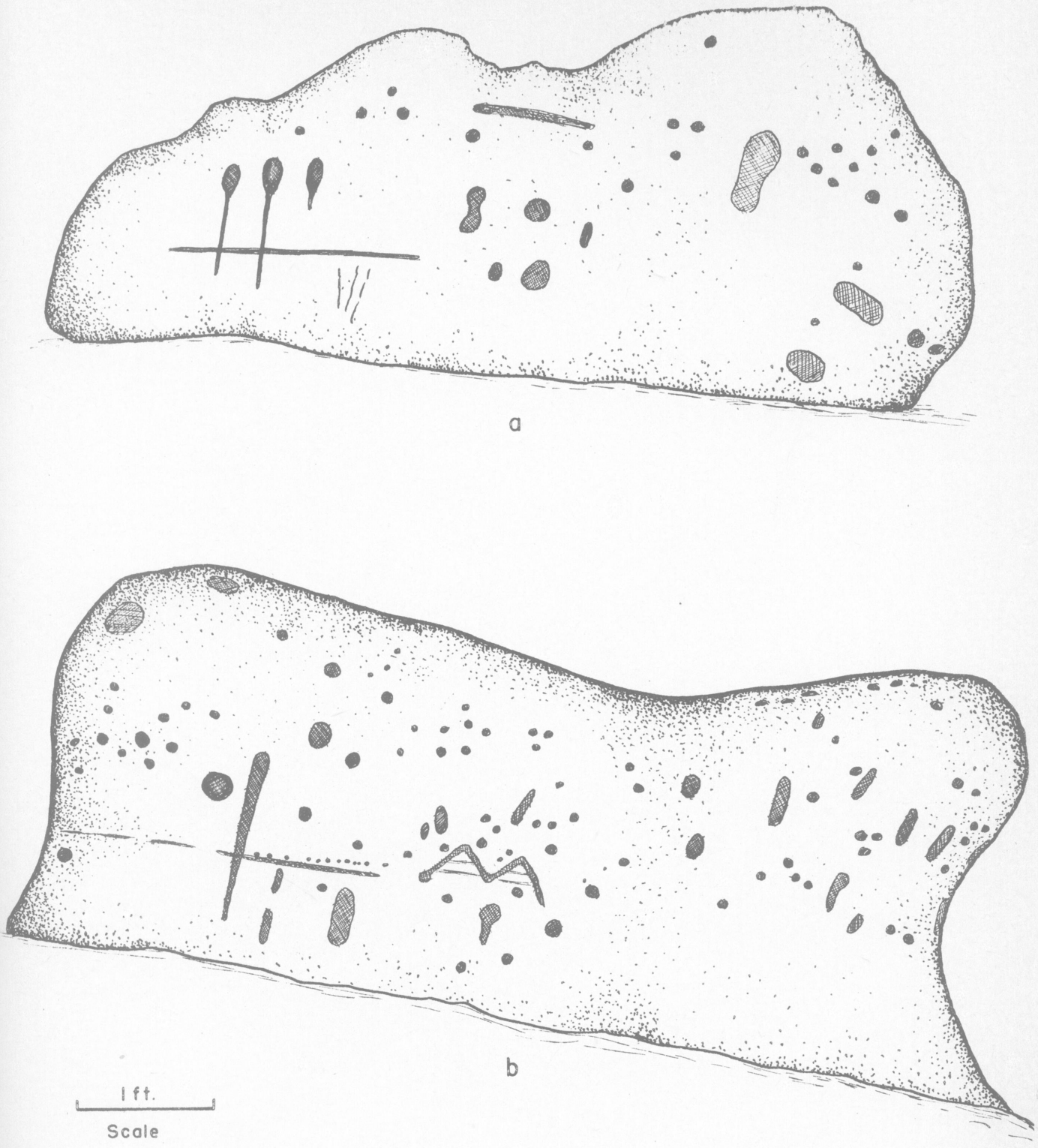


Fig. 1


1 ft.
Scale
Present Ground Level
a
b
Present Ground Level
c
Present ground Level
d
e
f

Fig. 2

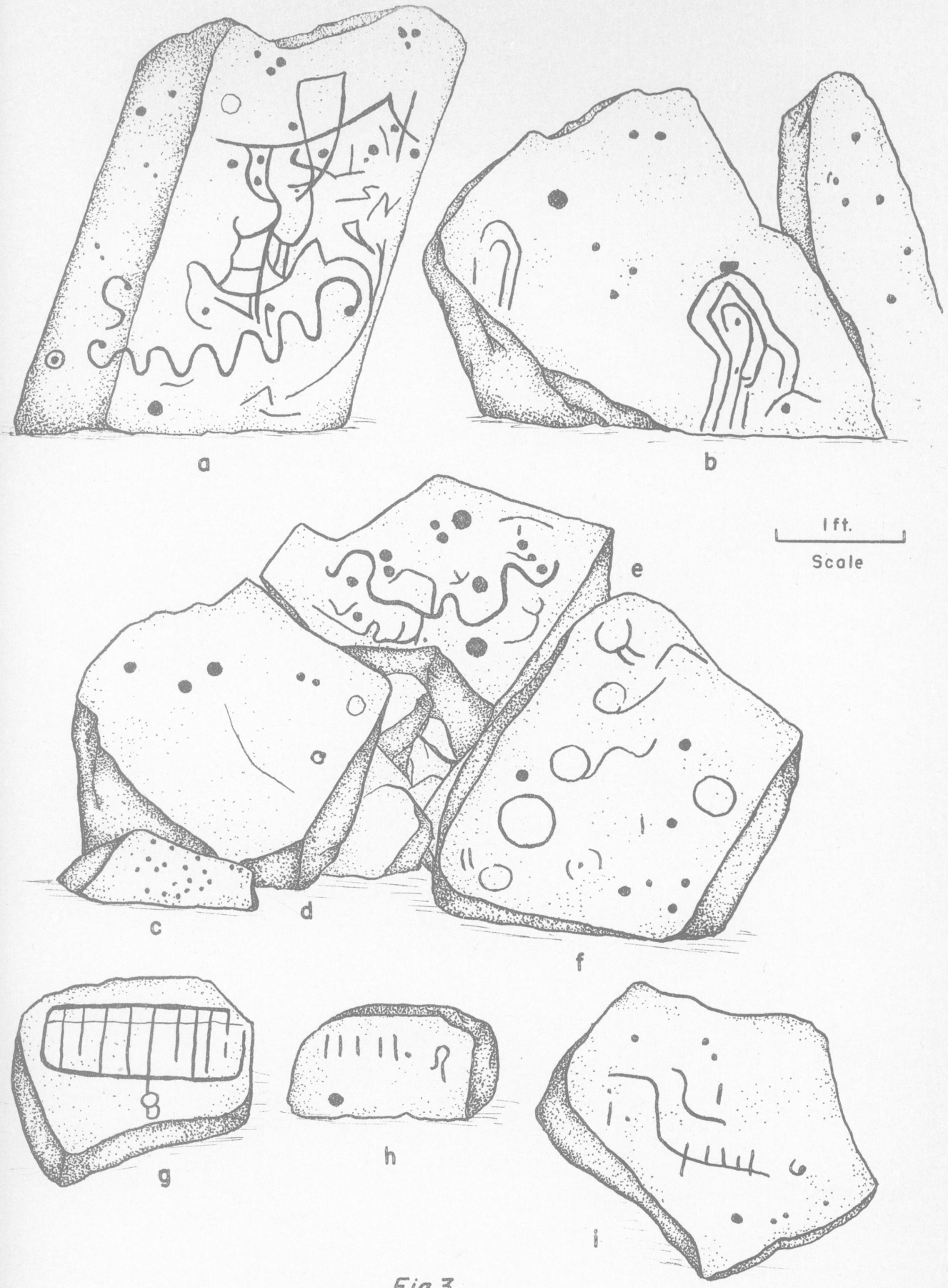


Fig.3

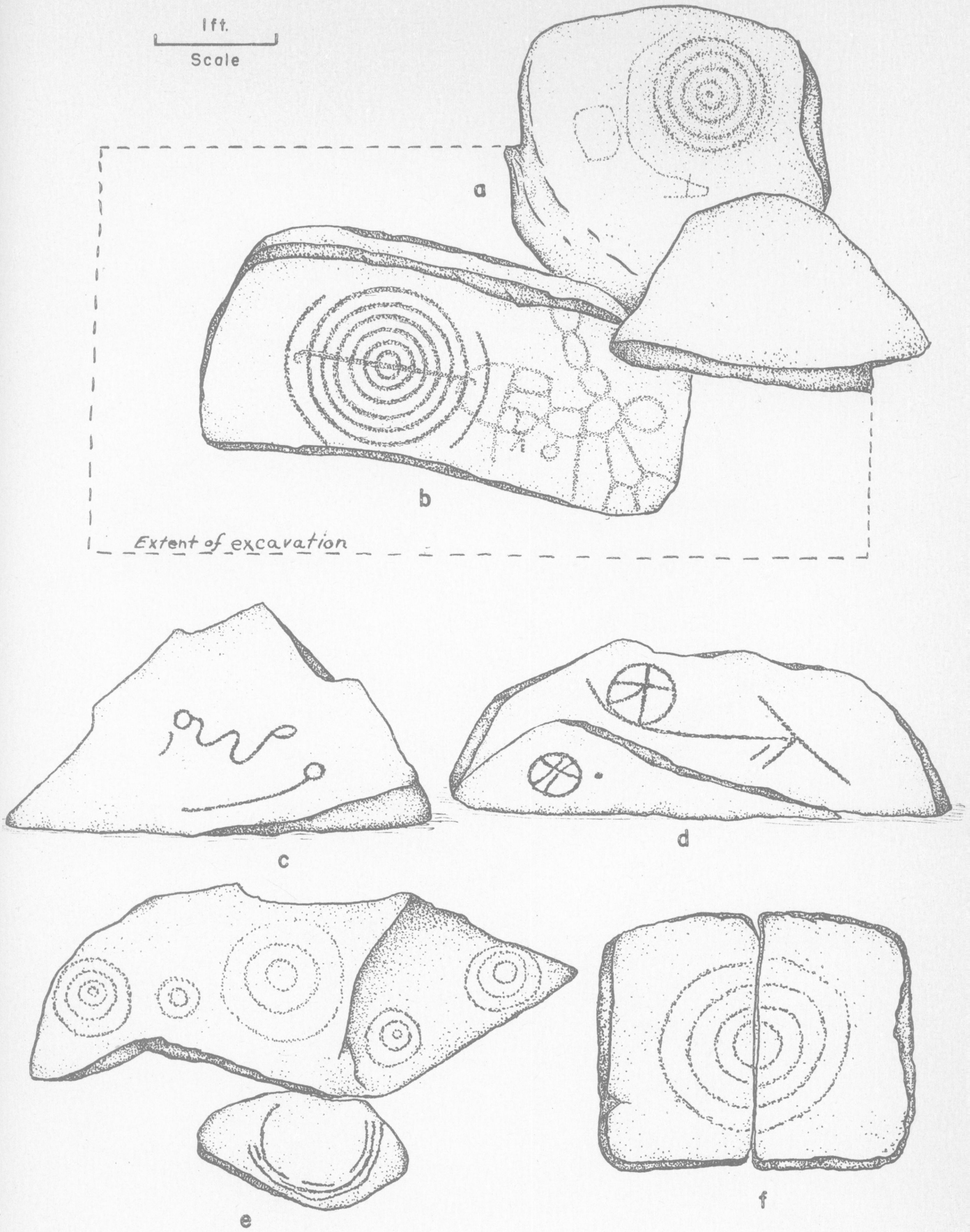


Fig. 4

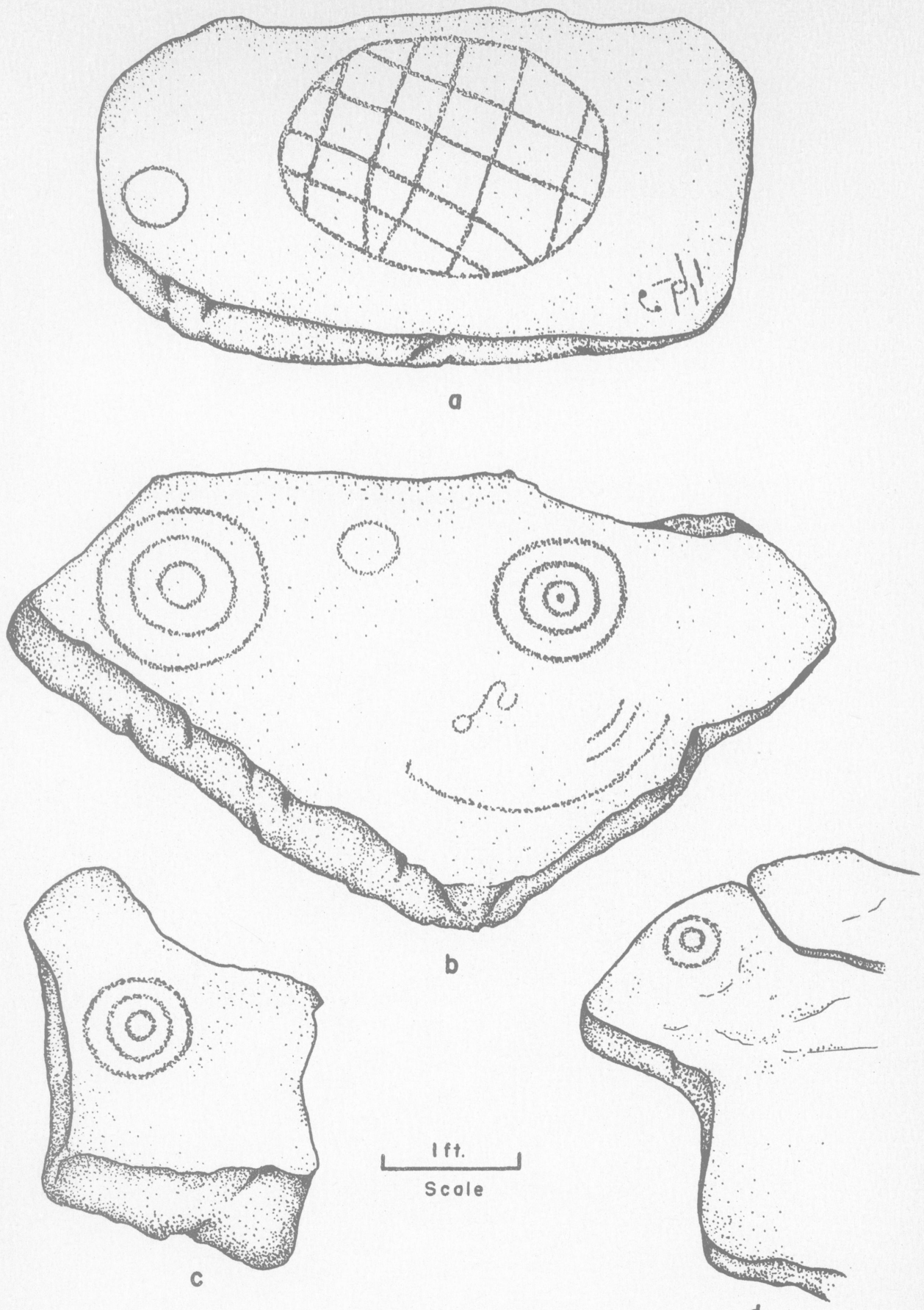
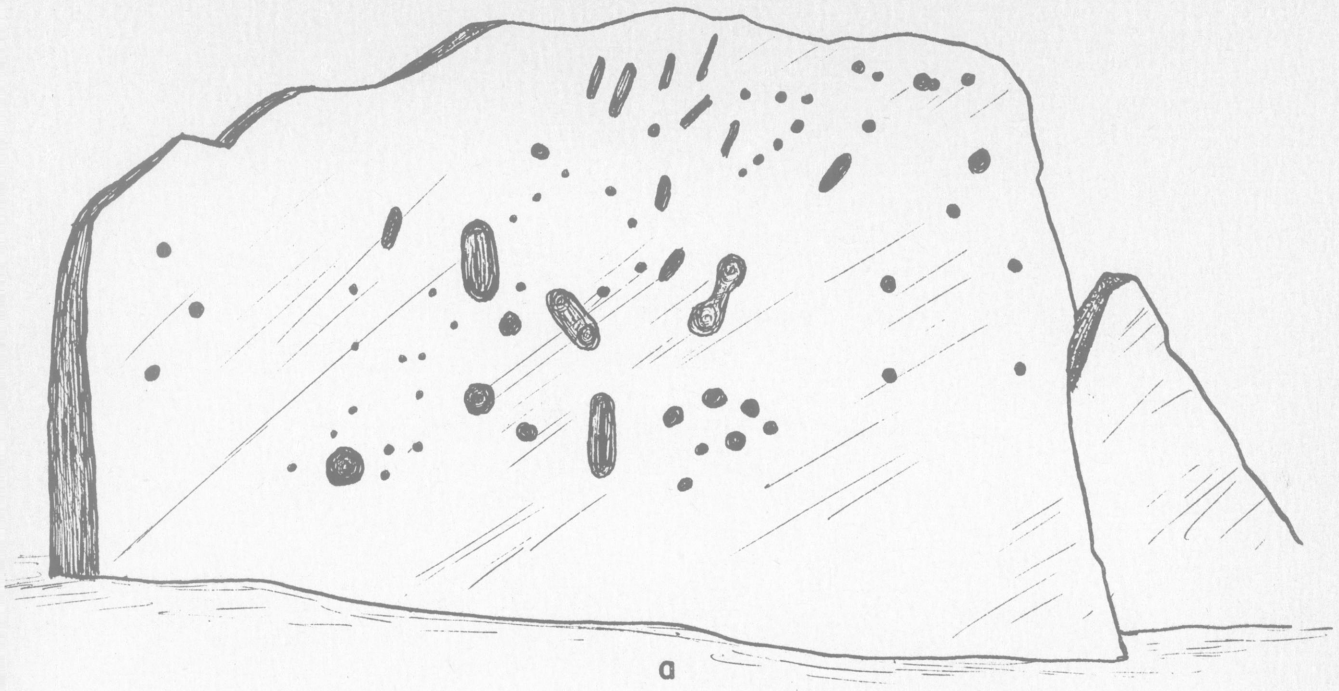
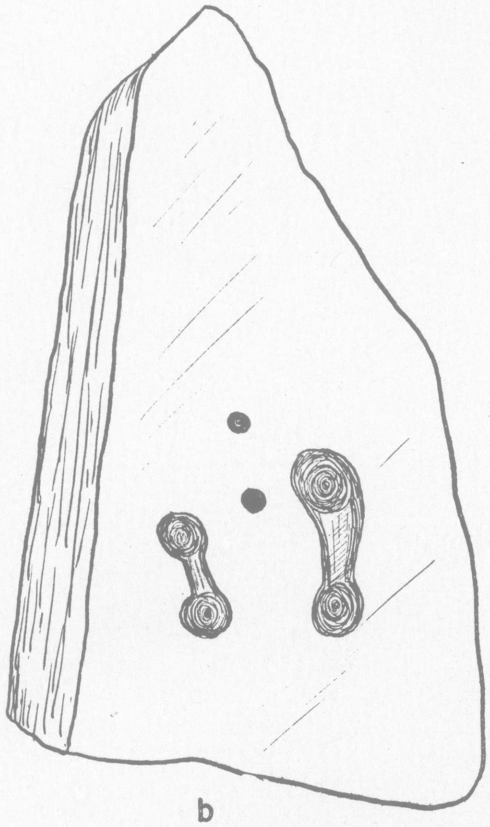


Fig. 5



a



b

1ft.
Scale

Fig. 6

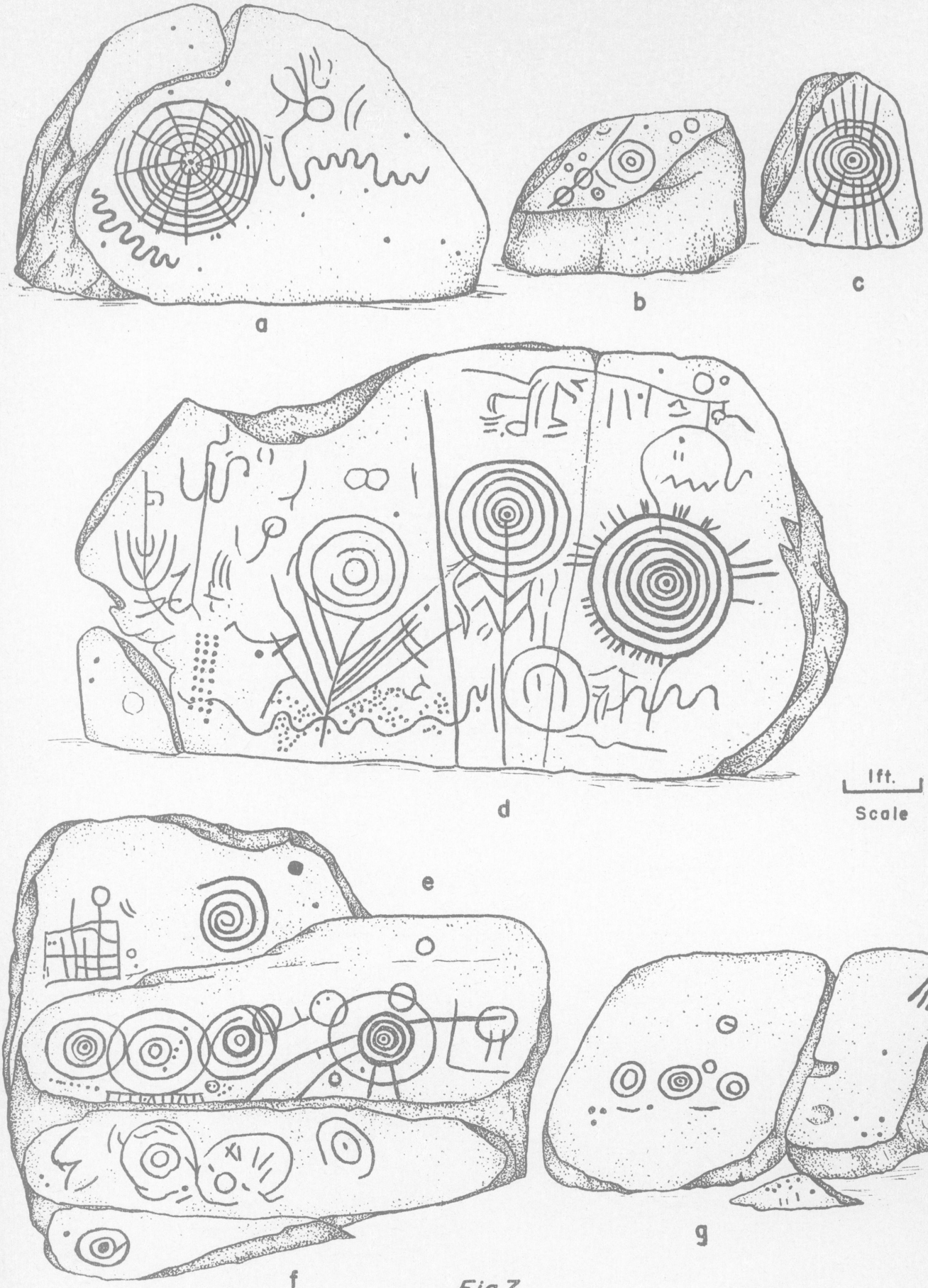
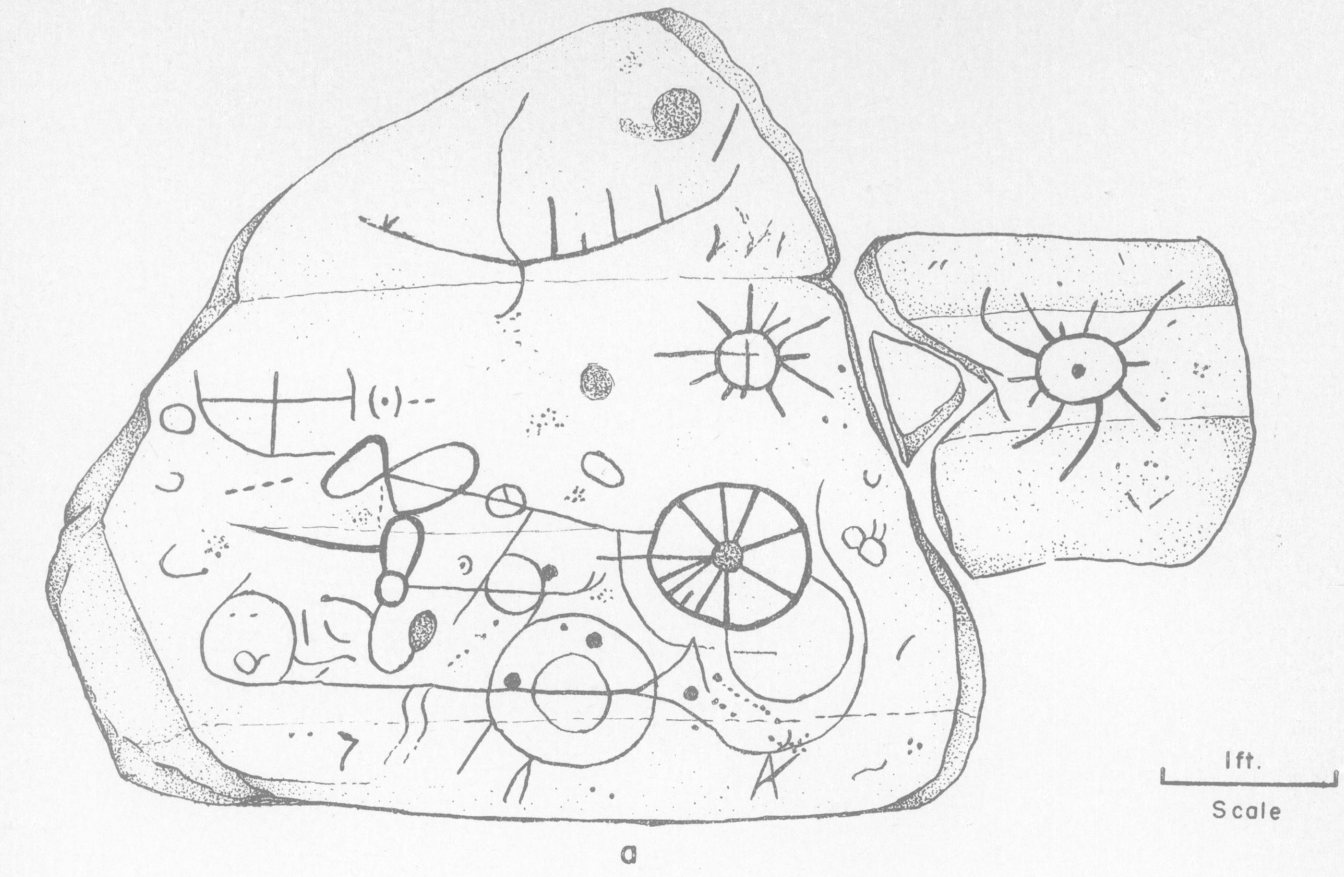


Fig.7



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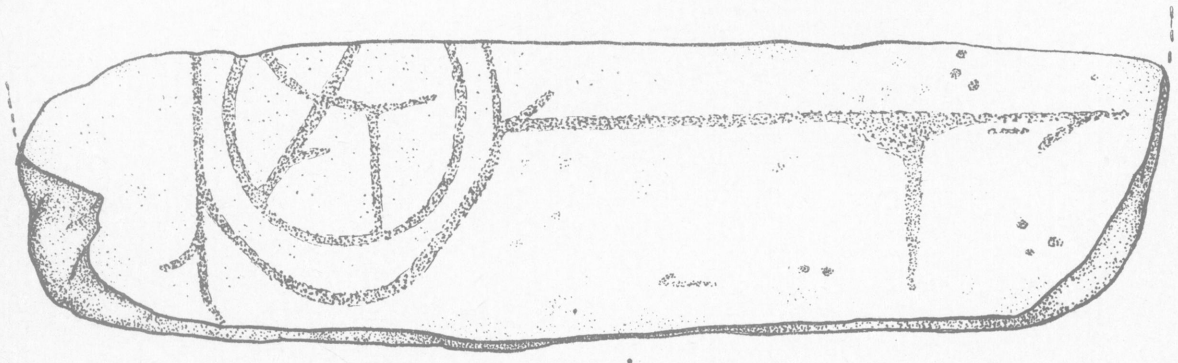

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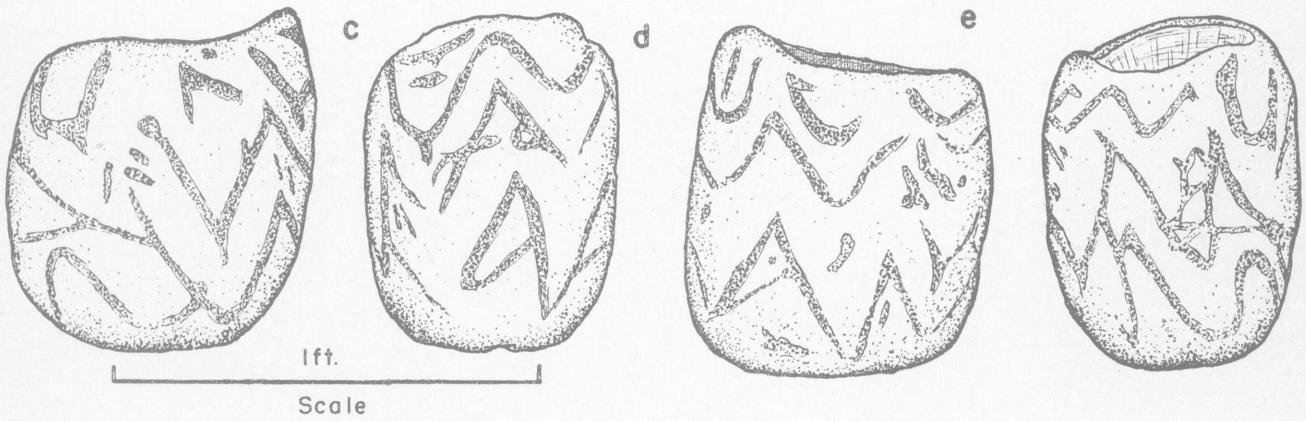

Fig. 8